

## PART 834 --- RADIATION PROTECTION OF THE PUBLIC AND THE ENVIRONMENT

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## Subpart A --- General Provisions

### §834.1 Scope.

(a) General. The requirements in this part govern activities conducted by, or for, the Department that could result in the release of radioactive material, the exposure of members of the public to ionizing radiation, or contamination of the environment with radionuclides from DOE activities.

(b) Dose Limits. The public dose limits in this rule are intended to apply to doses to members of the general public from routine DOE operations and operational occurrences. The dose limits are not intended to be safety design criteria or guides for mitigating the consequences of accidents.

(c) Exclusions. The requirements in this part do not apply to:

(1) activities that are regulated through a license by the U.S. Nuclear Regulatory Commission (NRC), or by an Agreement State acting under an agreement with the NRC under Sec. 274 of the Atomic Energy Act; or

(2) activities conducted under the authority of the Director, Office of Naval Reactors, as described in Pub.L. 98-525; or

(3) exposures of patients to ionizing radiation for the purpose of medical diagnosis or therapy and exposures of volunteers for medical research programs; or

(4) exposures to background radiation, including global fallout from nuclear testing and past accidents; or

(5) consumer products containing nominal amounts of radioactive material or producing nominal amounts of radiation; or

(6) exposures of workers which arise during the performance of work duties.

### §834.2 Definitions.

As used in this part:

(a) **General terms.**

Act means the Atomic Energy Act of 1954, as amended.

Actual and likely use scenarios means those that represent: the reasonably anticipated future uses of land or property considering the history of use; Federal and State use designations; local zoning and future land use plans; and proximity to residences, affected populations, or ecosystems, natural resources, or unique areas of historic or cultural significance.

Airborne emissions means material released to the atmosphere in the form of dusts, fumes, particulates, mists, vapors, or gases.

ALARA means "As Low As is Reasonably Achievable" which is an approach used for radiation protection to manage and control exposures (both individual and collective to the work force and to the general public) and releases of radioactive material to the environment so that the levels are as low as is reasonable taking into account social, technical, economic, practical, and public policy considerations. As used in this part, ALARA is not a dose limit, but rather a process which has the objective of attaining doses as far below the applicable limit of this part as is reasonably achievable.

ALARA process means a logical procedure for evaluating alternative operations, processes, and other measures, for reducing exposures to radiation and emissions of radioactive material into the environment, taking into account societal, environmental, technological, economic, practical and public

policy considerations to make a judgment concerning the optimum level of public health protection.

ALARA program means the set of design specifications, operating procedures, techniques, monitoring and surveillance programs, records, and instructions used to implement the ALARA process.

Authorized residual contamination limit means limit on the concentrations of residual radioactive material on the surfaces of, or within, property, such limit having been derived under the ALARA process given the anticipated use of the property (either restricted or unrestricted), and having been authorized by the Department to permit the release of property from DOE control.

Background radiation means radiation from: (i) naturally-occurring radioactive materials, as they exist in nature prior to removal, transport, or enhancement or processing by man; (ii) cosmic and natural terrestrial radiation; (iii) global fallout as it exists in the environment; (iv) consumer products containing nominal amounts of radioactive material or emitting nominal levels of radiation; and (v) radon and its progeny in concentrations or levels existing in buildings or the environment which have not been elevated as a result of current or past Departmental activities.

Best Available Technology (BAT) means the preferred technology for a particular activity, selected from among others after taking into account factors related to technology, economics, public policy, and other parameters. As used in this part, the BAT is not a specific level of treatment, but is the conclusion of a selection process in which several alternatives are evaluated.

BAT selection process means the evaluation of candidate alternative technologies in order to select the BAT after considering: technology; economics; the age of equipment and facilities involved; the process employed; the engineering aspects of the application of various types of control techniques; process changes; other environmental impacts (including energy requirements); safety considerations; and policy considerations.

Contamination means the presence of excess radioactive material from a DOE activity in or on a material or property.

DOE activity means an activity taken for or by the Department that has the potential to result in exposures of persons to radiation. The activity may involve a single DOE facility, or a combination of facilities and operations, possibly including an entire site or no fixed site at all.

DOE facility means something that is built, installed, or established to serve a particular DOE activity.

Drinking water means potable water.

Effluent monitoring means the collection and analysis of samples or measurements of liquid and gaseous effluents for purposes of characterizing and quantifying contaminants, assessing radiation exposures of members of the public, and demonstrating compliance with applicable standards.

Environmental surveillance means the collection and analysis of samples of air, water, soil, foodstuffs, biota, and other media from DOE sites and their environs and the measurement of external radiation for purposes of demonstrating compliance with applicable standards, assessing radiation exposures to members of the public, and assessing effects, if any, on the local environment.

Facility boundary means the perimeter of an area containing a facility, within which the access and presence of persons can be controlled by the operator of the facility.

Federally-permitted release is as defined in Section 101(10) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, (Public Law 96-510, CERCLA). This definition includes: "(K) any release of source, special nuclear and byproduct material, as those terms are defined in the Atomic Energy Act of 1954 [42 U.S.C. 2011 et seq.], in compliance with a legally enforceable license, permit, regulation, or order issued pursuant to the Atomic Energy Act of 1954."

Global fallout means radioactive material arising from the detonation of nuclear weapons or devices, nuclear accidents, or debris from aerospace devices which has been widely dispersed by natural

environmental forces over a substantial area of the earth.

Liquid discharges means the release to the environment of soluble or insoluble material in a liquid media. The discharge generally occurs at a point, such as the end of a pipe, where it is released to any of several receptors in the environment, such as a waterway, land, sewer system, etc. However, it could be the result from sheet flow, such as storm runoff.

Mass (or volume) contamination means contamination which is found throughout the mass (or volume) of the material or property, e.g., matter activated by irradiation.

Member of the public means an individual other than a worker performing a work assignment related to a DOE activity. A DOE worker is considered to be a member of the public when not at work.

Nonstochastic (or deterministic) effect means a biological effect, the severity of which varies with the magnitude of the radiation dose above a threshold value, e.g., cataracts of the eye.

Occupational exposure means exposure of a person to radiation (external and internal) as a consequence of his work assignment.

Person means any individual; corporation; partnership; firm; association; trust; estate; public or private institution; group; Government Agency; any State or political subdivision of, or any political entity within a State; or any foreign government or nation or other entity and any legal successor, representative, agent, or agency of the foregoing; provided that person does not include the Department of Energy.

Property means something owned or possessed, or to which a person has a legal title.

Protective Action Guides (PAG) mean projected numerical dose values established by EPA, the Department, or States that may trigger protective actions intended to reduce or avoid the projected dose.

Radon-222 generating waste means any waste or residue in areas used for storage or disposal that contains radium-226 in concentrations that are sufficient to emit radon-222 in excess of 20 pCi/m<sup>2</sup>-sec, if not otherwise controlled.

Radiation means ionizing radiation, e.g., alpha particles, beta particles, gamma rays, x-rays, neutrons, protons, and other particles capable of producing ion pairs in matter. As used in this part, radiation does not include non-ionizing radiation.

Radioactivity means the property or characteristic of radioactive material to undergo spontaneous transformations ("disintegrations" or "decay") with the emission of energy in the form of radiation. It means the rate of spontaneous transformations of a radionuclide. The unit of radioactivity is the curie, Ci (or becquerel, Bq). (1 Ci = 3.7 x 10<sup>10</sup> Bq)

Release of property means permission to transfer property from DOE control.

Remedial actions means those actions, consistent with a permanent remedy, taken to control or remove contaminants to prevent or to minimize the doses from the interaction of members of the public with the released property.

Residual radioactive material means any radioactive material which is in or on soil, air, water, equipment, or structures as a consequence of past operations or activities.

Restricted release means permission to remove an item, personal property, or real property from DOE access control for a specifically-stated application, e.g., to manage exposures to radioactive material by restricting the use of property.

Sanitary sewerage means a system of public sewers for carrying off waste water and refuse, but excluding sewage treatment facilities, septic tanks, and leach fields owned or operated by, or for, the Department.

Scenario means a set of exposure conditions presumed for the purpose of estimating doses to persons who might have contact with contaminated property.

Settleable solids means: (i) that matter in waste water which will not stay in suspension during a preselected settling period, such as one hour, but settles to the bottom; (ii) in the Imhoff cone test, the

volume of matter that settles to the bottom of the cone in one hour; or (iii) suspended solids that can be removed by conventional sedimentation processes.

Sewage means waste matter that passes through sewers.

Sewer means an artificial conduit, usually underground, for carrying off waste water and refuse.

Sewerage means a system of sewers.

Site means the land or property upon which DOE facilities or activities are located and access to which is subject to Departmental or DOE contractor control.

Site boundary means the perimeter of a DOE site, within which the Department or a DOE contractor normally can control access or restrict activities.

Soil column means an in situ volume of soil through which liquid waste percolates from ponds, cribs, seepage basins, or trenches with the primary purpose being to retain suspended or dissolved radioactive material. Drain fields (unless used specifically for radionuclide disposal) and natural ground surfaces are not soil columns.

Stochastic effect means a biological effect for which the probability, rather than the severity, is assumed to be a function of the magnitude of the radiation dose without threshold; i.e., stochastic effects are random in nature, e.g., cancer and hereditary diseases.

Supplemental residual contamination limits means limits similar to the Authorized Limits, but different owing to special circumstances which make the Authorized Limits inappropriate or impracticable to apply to a specified part of the property or a particular piece of property.

Surface contamination means contamination on the surface of a material or property, including surfaces that are not readily accessible, such as those covered by paint, sealers, or the inside portion of a pipe.

Surface water means a creek, stream, river, pond, lake, bay, sea, or other waterway which is directly exposed to the atmosphere. Underground water sources, e.g., aquifers, are not surface waters.

Unrestricted release means release of an item or real property from DOE control.

Worst plausible use scenarios are any scenarios deemed credible, even over the long term, e.g., beyond several hundred years.

Year means the period of time, beginning on or near January 1, used to determine compliance with the provisions of this part. The starting date of the year used to determine compliance may be changed provided that the change is made at the beginning of the year and no day is omitted or duplicated in consecutive years.

(b) **Radiation dose terms.** As used in this part to describe various aspects of radiation dose:

Absorbed dose means the energy absorbed in matter by ionizing radiation per unit mass of irradiated material at the place of interest in that material. The absorbed dose is expressed in units of rad (or gray). (1 rad = 0.01 gray.)

Annual Limit of Intake (ALI) means the quantity of a radionuclide which, if taken into the body of a member of the public characterized by reference man during one year, would result in a committed effective dose equivalent of 100 mrem.

Collective dose means the sum of the effective dose equivalent to all persons in a specified population received in a specified period of time. Collective dose is expressed in units of person-rem (or person-sievert).

Committed dose equivalent means the predicted dose equivalent to a tissue or organ over a 50-year period after an intake of a radionuclide into the body. It does not include dose contributions from radiation sources external to the body. Committed dose equivalent is expressed in units of rem (or sievert). (1 rem = 0.01 Sv.)

Committed effective dose equivalent means the sum of the committed dose equivalents to

various organs or tissues in the body from radioactive material taken into the body, each multiplied by the tissue-specific weighting factor. Committed effective dose equivalent is expressed in units of rem (or sievert).

Derived Concentration Guide (DCG) means the concentration of a radionuclide in air or water that, under conditions of continuous exposure for one year by one exposure mode (e.g., ingestion of water, submersion in air, or inhalation of air), would result in an effective dose equivalent equal to the annual dose limit applicable to the group exposed. For exposure of the public, the DCG is the concentration in a medium (e.g., air or water) that would result in a committed EDE of 100 mrem (1 mSv) to reference man--who inhales 8400 cubic meters of air and ingests 730 liters of water in a year. DCG for air [or water] = Annual Limit of Intake (for member of the public) divided by the volume of air [or water] taken in by reference man in a year.

Dose equivalent means the product of absorbed dose in rad (or gray) in tissue, a quality factor, and all other modifying factors at the location of interest. Dose equivalent is expressed in units of rem (or sievert).

Effective dose equivalent (EDE) means the sum of the products of the dose equivalent received by specified tissues of the body and a tissue-specific weighting factor. The effective dose equivalent is expressed in units of rem (or sievert).

Potential dose means a calculated dose is based on a postulated set of exposure conditions that have a reasonable probability of occurrence.

Public dose means the dose received by members of the public from exposure to radiation and to radioactive material released by a DOE activity whether the exposure is within a DOE site boundary or offsite.

Quality factor means the principal modifying factor used to calculate the dose equivalent from the absorbed dose (the absorbed dose is multiplied by an appropriate quality factor). Quality factors for various types of radiation, set forth in 10 CFR Part 835, "Occupational Radiation Protection," §835.2, also are appropriate for evaluating doses to members of the public. Reference man means a hypothetical aggregation of human (male and female) physical and physiological characteristics arrived at by international consensus for the purpose of standardizing radiation dose calculations.

Total Effective Dose Equivalent (TEDE) is the sum of the EDE from radiation sources external to the body during the year plus the committed EDE from radionuclides taken into the body. A 50-year time interval is assumed for determining committed dose.

WEIGHTING FACTOR MEANS A TISSUE-SPECIFIC FACTOR REPRESENTING THE FRACTION OF THE TOTAL HEALTH RISK RESULTING FROM UNIFORM WHOLE-BODY IRRADIATION, ATTRIBUTABLE TO THE PARTICULAR TISSUE OR ORGAN. WEIGHTING FACTORS SET FORTH IN 10 CFR 835.2 ARE ALSO APPROPRIATE FOR EVALUATING DOSES TO MEMBERS OF THE PUBLIC.

WORKING LEVEL (WL) MEANS THE POTENTIAL ALPHA ENERGY CONCENTRATIONS OF RADON DECAY PRODUCTS IN 1 LITER OF AIR, WITHOUT REGARD TO THE DEGREE OF EQUILIBRIUM, THAT WILL RESULT IN THE EVENTUAL EMISSION OF  $1.3 \times 10^5$  MeV OF ALPHA PARTICLE ENERGY.

WORKING LEVEL MONTH (WLM) MEANS THE EXPOSURE TO THE EQUIVALENT RADON DAUGHTER CONCENTRATION OF ONE WORKING LEVEL FOR 170 HOURS.

(C) TERMS DEFINED IN THE ACT AND NOT DEFINED IN THIS PART ARE USED CONSISTENT WITH THE MEANINGS GIVEN IN THE ACT.

(D) AS USED IN THIS PART, WORDS IN THE SINGULAR ALSO INCLUDE THE PLURAL AND WORDS IN THE MASCULINE GENDER ALSO INCLUDE THE FEMININE AND VICE VERSA.

### **§834.3 GENERAL CONDITIONS.**

(A) NO PERSON OR DOE PERSONNEL SHALL TAKE, OR CAUSE TO BE TAKEN, ANY ACTION

INCONSISTENT WITH THE REQUIREMENTS OF:

- (1) THIS PART;
- (2) ANY PROGRAM, PLAN, SCHEDULE, OR OTHER PROCESS ESTABLISHED BY THIS PART; OR
- (3) ANY APPLICABLE FEDERAL STATUTE OR REGULATION CONCERNING THE EXPOSURE OF

MEMBERS OF THE PUBLIC TO RADIATION OR THE CONTAMINATION OF THE ENVIRONMENT WITH RADIOACTIVE MATERIAL.

(B) WITH RESPECT TO A PARTICULAR DOE ACTIVITY, THE PERSON IN CHARGE OF THE ACTIVITY SHALL BE RESPONSIBLE FOR THE IMPLEMENTATION OF, AND COMPLIANCE WITH, THE REQUIREMENTS OF THIS PART.

(C) WHERE THERE IS NO CONTRACTOR IN CHARGE OF A DOE ACTIVITY, THE DEPARTMENT SHALL ACT TO ENSURE IMPLEMENTATION OF, AND COMPLIANCE WITH, THE REQUIREMENTS OF THIS PART.

(D) NOTHING IN THIS PART SHALL BE CONSTRUED AS LIMITING ACTIONS THAT MAY BE NECESSARY TO PROTECT HEALTH AND SAFETY.

#### **§834.4 COMPLIANCE AND ENFORCEMENT.**

(A) COMPLIANCE WITH THIS PART SHALL BE ACHIEVED NO LATER THAN **[INSERT DATE---18 MONTHS AFTER THE EFFECTIVE DATE OF RULE]**.

(B) THE REQUIREMENTS IN THIS PART ARE SUBJECT TO ENFORCEMENT BY ALL APPROPRIATE MEANS, INCLUDING THE IMPOSITION OF CIVIL AND CRIMINAL PENALTIES IN ACCORDANCE WITH THE PROVISIONS OF 10 CFR PART 820, PROCEDURAL RULES FOR DEPARTMENT OF ENERGY (DOE) ACTIVITIES.

#### **§834.5 ENVIRONMENTAL RADIOLOGICAL PROTECTION PROGRAM.**

(A) DOE ACTIVITIES THAT ROUTINELY GENERATE, HANDLE, PROCESS, OR DISPOSE OF RADIOACTIVE MATERIALS SHALL ESTABLISH AN ENVIRONMENTAL RADIOLOGICAL PROTECTION PLAN (ERPP) FOR THESE ACTIVITIES. THE ERPP MAY INCLUDE, BY REFERENCE, SECTIONS OR CHAPTERS OF OTHER DOCUMENTS OR MATERIAL THAT ARE APPLICABLE FOR DOCUMENTING PLANS, PROCEDURES, AND SCHEDULES FOR COMPLIANCE WITH THIS PART.

(B) A DOE ACTIVITY SHALL BE CONDUCTED IN ACCORDANCE WITH THE ERPP, INCLUDING ANY MODIFICATIONS MADE OR DIRECTED BY THE DEPARTMENT.

(C) THE CONTENT OF THE ERPP SHALL ADDRESS EACH REQUIREMENT OF THIS PART AND INCLUDE, BUT NOT BE LIMITED TO, THE FOLLOWING:

- (1) THE IDENTITY OF EXISTING OR ANTICIPATED DOE ACTIVITIES SUBJECT TO THE REQUIREMENT;
- (2) THE MEASURES TO BE USED IN IMPLEMENTING THE REQUIREMENT;
- (3) THE METHODS TO BE USED IN MONITORING, REPORTING, AND RECORDING COMPLIANCE WITH THE REQUIREMENT;
- (4) AN AS LOW AS IS REASONABLY ACHIEVABLE (ALARA) PROGRAM [§834.104];
- (5) ENVIRONMENTAL MONITORING [§834.7] INCLUDING
  - (I) SOURCES OF AIRBORNE EMISSIONS [§834.201],
  - (II) SOURCES OF EMISSIONS IN LIQUID WASTE STREAMS [§§834.211 AND 834.212],
  - (III) EFFLUENT MONITORING [§834.7(b)(1)],

(IV) ENVIRONMENTAL SURVEILLANCE [§834.7(B)(2)],  
(V) METEOROLOGICAL DATA ACQUISITION [§834.7(B)(3)], AND  
(VI) PREOPERATIONAL MONITORING [§834.7(B)(4)];  
(6) GROUND WATER PROTECTION [§834.215]; AND  
(7) RADIOLOGICAL PROTECTION IN THE MANAGEMENT OF RADIOACTIVE WASTE [§834.221] AND PROPERTY CONTAINING RESIDUAL RADIOACTIVE MATERIAL [SUBPART G].

(D) THE ERPP SHALL IDENTIFY THE ORGANIZATION(S) RESPONSIBLE FOR PREPARATION OF THE ANNUAL SITE ENVIRONMENTAL REPORT (SEE §834.404) AND, WHERE APPROPRIATE, INTEGRATION OF DATA FROM VARIOUS FACILITIES ON THE SITE.

(E) THE ERPP MAY BE INTEGRATED INTO A SITE-WIDE ENVIRONMENTAL PROTECTION PROGRAM. IF THIS IS DONE, THOSE SECTIONS WHICH COMPRISE THE ERPP SHALL BE CLEARLY IDENTIFIED.

(F) THE ERPP SHALL INCLUDE PLANS, SCHEDULES, AND OTHER MEASURES FOR ACHIEVING COMPLIANCE WITH THE PROVISIONS OF THIS PART.

(G) THE CONTENTS OF THE ERPP SHALL BE COMMENSURATE WITH THE NATURE OF THE DOE ACTIVITY AND THE RISK TO THE PUBLIC AND THE ENVIRONMENT FROM THE DOE ACTIVITY.

(H) THE DOE-APPROVED ERPP FOR AN EXISTING DOE ACTIVITY SHALL BE IN PLACE NOT LATER THAN **[INSERT DATE--1 YEAR AFTER THE EFFECTIVE DATE OF THE RULE]**.

(I) THE ERPP FOR A NEW OR MODIFIED DOE ACTIVITY, OR MODIFICATIONS OF AN EXISTING ERPP TO INCLUDE A NEW ACTIVITY, SHALL BE SUBMITTED TO THE DEPARTMENT AT LEAST 180 DAYS PRIOR TO THE INITIATION OF THE DOE ACTIVITY, EXCEPT FOR ACTIVITIES MEETING THE CONDITIONS OF §834.5(M), AND SHALL BE REVIEWED AND UPDATED WHEN NECESSARY.

(J) AN UPDATE OF AN ERPP SHALL BE SUBMITTED TO THE DEPARTMENT:

(1) WHENEVER THERE IS A CHANGE OR ADDITION TO THE ERPP; AND

(2) WITHIN 180 DAYS OF THE EFFECTIVE DATE OF ANY MODIFICATION TO THIS PART THAT SHOULD BE REFLECTED IN THE ERPP.

(K) THE INITIAL ERPP OR AN UPDATE SHALL BE CONSIDERED APPROVED 90 DAYS AFTER ITS SUBMISSION, UNLESS IT IS APPROVED OR REJECTED BY THE DEPARTMENT ON AN EARLIER DATE;

(L) CHANGES, ADDITIONS, OR UPDATES TO THE ERPP SHALL BECOME EFFECTIVE WITHOUT PRIOR DEPARTMENT APPROVAL ONLY IF THE CHANGES DO NOT DECREASE THE EFFECTIVENESS OF THE ERPP AND THE ERPP, AS REVISED, CONTINUES TO MEET THE REQUIREMENTS OF THIS PART AND THE DEPARTMENT IS PROVIDED WRITTEN NOTIFICATION OF THE CHANGE.

(M) THE ERPP SHALL INCLUDE ANY MODIFICATIONS MADE OR DIRECTED BY THE DEPARTMENT, EITHER BEFORE OR AFTER ITS APPROVAL BY THE DEPARTMENT.

#### **§834.6 DOSE EVALUATIONS.**

(A) THE EXPOSURE-TO-DOSE CONVERSION FACTORS IN DOE-APPROVED FEDERAL GUIDANCE REPORTS AND ANALYTICAL METHODS AND PARAMETERS SPECIFIED IN DOE GUIDANCE DOCUMENTS SHALL BE USED FOR DOSE ASSESSMENTS TO THE EXTENT THAT THEY ARE APPLICABLE AND IT IS PRACTICABLE TO DO SO.

(B) WHEN THE CITED METHODS ARE NOT AVAILABLE, OR ARE NOT APPROPRIATE FOR THE SPECIFIC CONDITIONS BEING EVALUATED, THE USE OF ALTERNATE METHODS OR PARAMETERS SHALL BE JUSTIFIED AND THE DOE-APPROVED ALTERNATE METHODS INCLUDED, OR REFERENCED, IN THE ERPP.

(C) DOSE ESTIMATES TO BE PERFORMED SHALL INCLUDE SITE-SPECIFIC INFORMATION, INCLUDING:

(1) THE LOCATION OF MEMBERS OF THE PUBLIC SUBJECT TO THE GREATEST POTENTIAL EXPOSURE;

(2) THE POPULATION DISTRIBUTION IN THE VICINITY SUBJECT TO EXPOSURES FROM THE DOE



ACTIVITY; AND

(3) EXPOSURE PATHWAYS GERMANE TO THE SITE.

(D) DOSES TO MEMBERS OF THE PUBLIC WHICH ARE HIGHER THAN 25 REM TEDE IN A YEAR, E.G., FROM ACCIDENTS, SHALL BE EVALUATED IN TERMS OF ABSORBED DOSE TO THE TOTAL BODY AND INDIVIDUAL ORGANS, RATHER THAN TEDE.

### **§834.7 ENVIRONMENTAL MONITORING PROGRAM**

(A) AN ENVIRONMENTAL MONITORING PROGRAM (EMP) SHALL BE ESTABLISHED TO CHARACTERIZE RELEASES OF RADIOACTIVE MATERIAL FROM A DOE ACTIVITY, ESTIMATE THE DISPERSAL PATTERN IN THE ENVIRONS, CHARACTERIZE THE PATHWAYS OF EXPOSURE TO MEMBERS OF THE PUBLIC, AND ESTIMATE THE DOSES TO INDIVIDUALS, TO THE POPULATION, AND TO THE BIOTA IN THE VICINITY OF THE DOE ACTIVITY.

(B) AN EMP, FOR A DOE ACTIVITY, SHALL INCLUDE:

(1) EFFLUENT MONITORING TO:

(I) DETERMINE QUANTITIES AND CONCENTRATIONS OF POLLUTANTS IN LIQUID AND AIRBORNE DISCHARGES; AND

(II) CHARACTERIZE THE EFFLUENT STREAMS, DISCHARGE MODES, AND RADIOLOGICAL PROPERTIES OF THE SOURCES.

(2) ENVIRONMENTAL SURVEILLANCE TO:

(I) DETERMINE THE LOCATION AND MAGNITUDE OF THE CONCENTRATIONS OF POLLUTANTS IN THE ENVIRONS, INCLUDING BIOTA;

(II) PROVIDE INFORMATION FROM DIRECT MEASUREMENTS AND SAMPLING TO CONFIRM THE ADEQUACY OF THE EFFLUENT MONITORING;

(III) IDENTIFY EXPOSURE PATHWAYS AND SITE-SPECIFIC PARAMETERS TO ESTIMATE DOSES TO MEMBERS OF THE PUBLIC; AND

(IV) DETERMINE THE LOCATION AND DISTRIBUTION OF MEMBERS OF THE PUBLIC IN THE ENVIRONS.

(3) METEOROLOGICAL DATA ACQUISITION TO:

(I) CHARACTERIZE ATMOSPHERIC TRANSPORT AND DISPERSION CONDITIONS IN THE VICINITY OF A DOE ACTIVITY;

(II) DESCRIBE METEOROLOGICAL CONDITIONS INCLUDING PRECIPITATION, TEMPERATURE, WIND SPEED, WIND DIRECTION, AND ATMOSPHERIC STABILITY THAT ARE IMPORTANT TO THE DISPERSION OF POLLUTANTS RELEASED TO THE ATMOSPHERE; AND

(III) SUPPORT ASSESSMENT OF POTENTIAL DOSES TO MEMBERS OF THE PUBLIC FROM ROUTINE AND NON-ROUTINE EMISSIONS.

(4) A PREOPERATIONAL STUDY, WHERE APPROPRIATE, TO:

(I) BEGIN AT LEAST ONE YEAR PRIOR TO THE START-UP OF A NEW DOE ACTIVITY, WHEN PRACTICABLE;

(II) ESTABLISH BACKGROUND LEVELS OF RADIATION AND RADIOACTIVE COMPONENTS;

(III) CHARACTERIZE PERTINENT ENVIRONMENTAL AND ECOLOGICAL PARAMETERS; AND

(IV) IDENTIFY POTENTIAL PATHWAYS FOR HUMAN EXPOSURE OR ENVIRONMENTAL IMPACT.

## **SUBPART B --- RADIATION DOSE LIMITS FOR MEMBERS OF THE PUBLIC**

### **§834.101 PRIMARY DOSE LIMITS.**

(A) A DOE ACTIVITY SHALL BE CONDUCTED IN A MANNER SUCH THAT THE EXPOSURE OF MEMBERS OF THE PUBLIC TO IONIZING RADIATION WILL:

(1) COMPLY WITH THE ALARA PROGRAM REQUIREMENTS IN §834.104; AND

(2) NOT CAUSE A TOTAL EFFECTIVE DOSE EQUIVALENT (TEDE) GREATER THAN 100 MREM (1 mSv) IN A YEAR FROM ALL SOURCES OF IONIZING RADIATION AND EXPOSURE PATHWAYS, EXCEPTING:

- (I) DOSE FROM RADON AND ITS DECAY PRODUCTS (WHICH IS REGULATED SEPARATELY);
- (II) DOSE RECEIVED BY PATIENTS FROM MEDICAL SOURCES OF RADIATION USED FOR DIAGNOSTIC OR THERAPEUTIC PURPOSES, AND BY VOLUNTEERS IN MEDICAL RESEARCH PROGRAMS;
- (III) DOSE FROM BACKGROUND RADIATION; AND
- (IV) DOSE TO WORKERS WHICH ARISE FROM DOE ACTIVITIES DURING THE PERFORMANCE OF WORK DUTIES AND WHICH ARE REGULATED UNDER 10 CFR PART 835.

(B) TEMPORARY LIMITS. UPON REQUEST, THE DEPARTMENT MAY AUTHORIZE TEMPORARY DOSE LIMITS FOR MEMBERS OF THE PUBLIC IN EXCESS OF 100 MREM (1 mSv) IN A YEAR, BUT NOT IN EXCESS OF 500 MREM (5 mSv). A REQUEST FOR AN AUTHORIZATION FOR A TEMPORARY OPERATION WHICH COULD RESULT IN A HIGHER DOSE LEVEL SHALL:

(1) BE SUBMITTED AS SOON AS PRACTICABLE WHEN THE NEED IS RECOGNIZED AND, WHERE POSSIBLE, BEFORE THE 100-MREM DOSE LIMIT IS EXCEEDED;

(2) CONTAIN:

- (I) A JUSTIFICATION FOR THE HIGHER DOSE LIMIT;
- (II) A DISCUSSION OF THE ALTERNATIVES CONSIDERED;
- (III) AN ALARA EVALUATION;
- (IV) AN ESTIMATE OF HOW LONG THE HIGHER LIMIT WILL BE NECESSARY; AND
- (V) A DESCRIPTION OF WHAT IS BEING DONE TO RETURN TO NORMAL OPERATIONS AND TO MINIMIZE DOSES TO MEMBERS OF THE PUBLIC.

(3) BE MADE PROMPTLY A MATTER OF PUBLIC RECORD DELINEATING THE NATURE OF THE UNUSUAL OPERATING CONDITION, AND THE BASIS FOR THE VARIANCE AS DOCUMENTED PER §834.101(B)(2).

#### **§834.102 DEMONSTRATING COMPLIANCE WITH DOSE LIMITS.**

(A) DOSE EVALUATIONS TO DEMONSTRATE COMPLIANCE WITH DOSE LIMITS IN THIS PART SHALL INCLUDE:

(1) THE DOSE TO MEMBERS OF THE PUBLIC RESIDING OR OTHERWISE OCCUPYING THE LOCATION MOST LIKELY TO RECEIVE THE HIGHEST DOSE FROM DIRECT EXPOSURE TO RADIATION, AIRBORNE EFFLUENT, LIQUID EFFLUENT, OR COMBINATIONS OF THESE EXPOSURE SOURCES OF DOE ORIGIN;

(2) CONSIDERATION OF LIKELY EXPOSURE PATHWAYS, INCLUDING:

- (I) DIRECT EXTERNAL IRRADIATION FROM RADIATION SOURCES LOCATED ONSITE;
- (II) EXTERNAL RADIATION FROM AIRBORNE RADIOACTIVE MATERIAL;
- (III) EXTERNAL RADIATION FROM RADIOACTIVE MATERIAL DEPOSITED ON SURFACES OFF-SITE;
- (IV) INTERNAL RADIATION FROM INHALED AIRBORNE RADIOACTIVE MATERIAL;
- (V) INTERNAL RADIATION FROM INGESTED RADIOACTIVE MATERIAL ON TERRESTRIAL FOOD CROPS;
- (VI) INTERNAL RADIATION FROM RADIOACTIVE MATERIAL INGESTED WITH FOOD FROM ANIMAL PRODUCTS, E.G., MEAT, EGGS, MILK;
- (VII) INTERNAL RADIATION FROM RADIOACTIVE MATERIAL INGESTED WITH AQUATIC FOOD PRODUCTS SUCH AS FISH, SHELLFISH, CRUSTACEANS (CRAYFISH, SHRIMP, CRAB, LOBSTERS), AND AQUATIC PLANTS AND ALGAE; AND
- (VIII) ANY OTHER PATHWAY UNIQUE TO THE DOE SITE OR ACTIVITY.

(3) THE DOSE TO MEMBERS OF THE PUBLIC FROM DOE ACTIVITIES ONLY, IF THE DOSE TO THE MAXIMALLY EXPOSED INDIVIDUALS RESULTING FROM ROUTINE DOE ACTIVITIES DOES NOT EXCEED 30 MREM IN YEAR;

(4) THE DOSES TO MEMBERS OF THE PUBLIC FROM RADIATION SOURCES OTHER THAN DOE ACTIVITIES AND EXCEPTED SOURCES WHEN:

(I) THE DOSE FROM ROUTINE DOE ACTIVITIES EXCEEDS 30 MREM IN THE YEAR; AND

(II) THE DOSE TO THOSE SAME INDIVIDUALS FROM THE OTHER EXPOSURES ALSO EXCEEDS 30 MREM IN THE YEAR.

(5) THE SUM OF THE DOSES FROM §834.102(A)(3) AND (4) WHEN THE DOSE TO MEMBERS OF THE PUBLIC FROM EACH OF THE SOURCES OF EXPOSURE EXCEEDS 30 MREM IN A YEAR TO THE SAME INDIVIDUALS.

(6) THE COLLECTIVE (POPULATION) DOSE RESULTING FROM RADIATION AND RADIOACTIVE MATERIALS EMITTED FROM THE DOE ACTIVITY ONLY; AND

(7) THE COLLECTIVE (POPULATION) DOSE RESULTING FROM RADON AND DAUGHTERS RELEASED BY DOE ACTIVITIES.

(B) DOSE ESTIMATES SHALL BE BASED ON SCENARIOS THAT ARE AS REALISTIC AS PRACTICABLE AND NOT LIKELY TO SUBSTANTIALLY UNDERESTIMATE THE DOSE TO ANY ACTUAL PERSON.

(C) SITE-SPECIFIC INFORMATION ON RADIATION SOURCE DISPERSION PATTERNS, LOCATION OF MEMBERS OF THE PUBLIC IN THE VICINITY OF THE DOE ACTIVITY, AND DOSE PATHWAY INFORMATION SHALL BE UPDATED, AS NECESSARY, TO EVALUATE DOSES IN THE ENVIRONS OF DOE ACTIVITIES.

(D) VALUES OF ASSUMED DEFAULT OR SITE-SPECIFIC PARAMETERS USED IN CALCULATIONS SHALL BE DISCUSSED AND INCLUDED WITH THE DOCUMENTATION OF THE CALCULATIONS.

(E) DIRECT MEASUREMENTS SHALL BE MADE, TO THE EXTENT PRACTICABLE, TO OBTAIN INFORMATION CHARACTERIZING SOURCE TERMS, EXPOSURES, EXPOSURE MODES, AND OTHER INFORMATION NEEDED IN EVALUATING DOSES.

#### **§834.103 [RESERVED]**

#### **§834.104 ALARA CONSIDERATIONS.**

(A) AN ALARA PROGRAM SHALL BE ESTABLISHED TO CONTROL AND MANAGE RELEASES OF RADIOACTIVE MATERIALS AND RADIATION EXPOSURES OF MEMBERS OF THE PUBLIC TO RADIATION AT LEVELS AS LOW AS IS REASONABLY ACHIEVABLE.

(B) AN ALARA PROGRAM SHALL ADDRESS:

(1) A STATEMENT OF COMMITMENT TO USE THE ALARA PROCESS;

(2) A DESCRIPTION OF THE MEANS TO BE USED TO IMPLEMENT THE ALARA PROCESS;

(3) A PROCESS FOR DOCUMENTING ALARA DECISIONS; AND

(4) A TRAINING PROGRAM FOR THE STAFF ON IMPLEMENTATION OF THE ALARA PROCESS.

(C) THE ALARA PROCESS SHALL DOCUMENT THE SOCIETAL, ENVIRONMENTAL, TECHNOLOGICAL, ECONOMIC, AND PUBLIC POLICY FACTORS CONSIDERED IN DECISION-MAKING, WHERE EXPOSURES TO RADIATION FROM DOE ACTIVITIES CAN OCCUR, AND SHALL INCLUDE:

(1) THE MAXIMUM DOSE TO MEMBERS OF THE PUBLIC;

(2) THE COLLECTIVE DOSE TO THE POPULATION;

(3) DOSES TO WORKERS;

(4) APPLICABLE ALTERNATIVE PROCESSES, SUCH AS ALTERNATIVE TREATMENTS OF DISCHARGE STREAMS, OPERATING METHODS, OR CONTROLS;

(5) DOSES FOR EACH ALTERNATIVE EVALUATED;

(6) COST FOR EACH ALTERNATIVE EVALUATED;

(7) AN EXAMINATION OF THE CHANGES IN COST AMONG ALTERNATIVES; AND

(8) SOCIETAL AND ENVIRONMENTAL (POSITIVE AND NEGATIVE) IMPACTS ASSOCIATED WITH ALTERNATIVES.

(D) EXPOSURE TO RADIATION, RELEASE OF RADIOACTIVE MATERIAL, AND OTHER RADIOLOGICAL CONTAMINATION FROM A DOE ACTIVITY SHALL BE DEEMED TO COMPLY WITH ALARA REQUIREMENTS IF IT IS EVALUATED AND CONDUCTED IN ACCORDANCE WITH AN ALARA PROGRAM APPROVED BY THE DEPARTMENT.

### **SUBPART C --- REQUIREMENTS APPLICABLE TO AIRBORNE SOURCES OF RADIATION**

#### **§834.201 AIRBORNE EMISSIONS OF RADIONUCLIDES.**

(A) A DOE ACTIVITY SHALL BE CONDUCTED IN A MANNER SUCH THAT THE RELEASE OF RADIOACTIVE MATERIAL TO THE ATMOSPHERE SHALL:

- (1) BE EVALUATED USING THE ALARA PROCESS;
  - (2) NOT CAUSE ANY MEMBER OF THE PUBLIC TO RECEIVE A TOTAL EFFECTIVE DOSE EQUIVALENT (TEDE) IN EXCESS OF 10 MREM (0.1 mSv) IN A YEAR--EXCLUDING DOSES FROM RADON-220 AND RADON-222 AND THEIR DECAY PRODUCTS AND FROM BACKGROUND SOURCES;
  - (3) NOT CAUSE ANNUAL RADON-222 FLUX RATES TO EXCEED 20 pCi (0.7 Bq) m<sup>-2</sup> sec<sup>-1</sup> AVERAGED OVER THE SURFACE AREA OVERLAYING THE WASTE, INCLUDING THE COVERING OR OTHER CONFINEMENT STRUCTURES, WHEREVER RADIUM-226 RESIDUES ARE ACCEPTED FOR STORAGE OR DISPOSAL.
  - (4) NOT CAUSE OUTDOOR ANNUAL CONCENTRATIONS OF RADON-220 OR RADON-222 RESULTING FROM A FACILITY WHERE SOURCES OF RADON ARE HANDLED OR PROCESSED TO EXCEED 3 pCi (0.1 Bq)/L ABOVE BACKGROUND AT THE FACILITY OR AT ANY LOCATION BEYOND THE FACILITY BOUNDARY WHICH IS ACCESSIBLE TO THE PUBLIC;
  - (5) NOT CAUSE AN ANNUAL RADON-220 OR RADON-222 AVERAGE CONCENTRATION TO EXCEED 0.5 pCi(0.02 Bq)/L ABOVE BACKGROUND AT ANY OFFSITE LOCATION WHERE PEOPLE RESIDE OR WORK;
- AND

(B) ACTIVITIES HAVING COMPLIANCE AGREEMENTS UNDER 40 CFR PART 61 OR OTHER APPLICABLE STANDARDS WHICH INCLUDE ALTERNATIVE PROCEDURES MAY INCLUDE SUCH PROCEDURES IN THE ERPP AND, IF APPROVED BY THE DEPARTMENT, COMPLIANCE WITH THOSE REQUIREMENTS WILL CONSTITUTE COMPLIANCE WITH APPLICABLE REQUIREMENTS OF THIS SECTION.

### **SUBPART D --- REQUIREMENTS APPLICABLE TO LIQUID SOURCES OF RADIATION**

#### **§834.211 LIQUID DISCHARGES.**

(A) A DOE ACTIVITY SHALL BE MANAGED IN A MANNER SUCH THAT THE RELEASE OF RADIOACTIVE MATERIALS IN LIQUID WASTE STREAMS, OTHER THAN SANITARY SEWER SYSTEMS, WILL:

- (1) COMPLY WITH ALARA PROCESS REQUIREMENTS;
- (2) BE TREATED BY THE BEST AVAILABLE TECHNOLOGY (BAT) IF:
  - (I) THE LIQUID WASTE DISCHARGED OTHERWISE WOULD CONTAIN, AT THE POINT OF DISCHARGE, A CONCENTRATION OF RADIOACTIVE MATERIAL, AVERAGED OVER THE YEAR, GREATER THAN THE DERIVED CONCENTRATION GUIDE (DCG) VALUES FOR INGESTION, OR
  - (II) THE ANNUAL TEDE TO MEMBERS OF THE PUBLIC RESULTING FROM THE LIQUID DISCHARGE CONTRIBUTES 10 MREM (0.1 mSv), OR MORE, OR
  - (III) THE COLLECTIVE DOSE EXCEEDS 100 PERSON-REM AND THE LIQUID DISCHARGE CONTRIBUTES 50%, OR MORE, OF THIS COLLECTIVE DOSE, OR
  - (IV) IT IS A PLANNED FEATURE WHICH IS PART OF THE GROUND-WATER PROTECTION PLAN FOR THE DOE ACTIVITY; AND
- (3) NOT RESULT IN THE RELEASE OF SETTLEABLE SOLIDS TO NATURAL WATERWAYS IF THE CONCENTRATION OF RADIOACTIVE MATERIAL IN THE SOLIDS IN THE WASTE STREAM EXCEEDS:

(i) 5 pCi (0.2 Bq) PER GRAM OF SETTLEABLE SOLIDS FOR ALPHA-EMITTING RADIONUCLIDES, OR  
(ii) 50 pCi (2 Bq) PER GRAM OF SETTLEABLE SOLIDS FOR BETA-GAMMA-EMITTING  
RADIONUCLIDES.

(B) FOR PURPOSES OF THIS REGULATION, STORMWATER RUNOFF AND PURGE WATERS THAT ARE CONTAMINATED WITH RESIDUAL RADIOACTIVE MATERIAL SHALL BE CONSIDERED LIQUID WASTE STREAMS AND CONTROLS SHALL BE IMPLEMENTED TO PREVENT SUCH CONTAMINATION OR TO CONTROL THE DISCHARGE, CONSISTENT WITH MANAGEMENT PRACTICES EMPLOYED FOR THE CONTROL OF NON-RADIOACTIVE COMPONENTS.

(C)(1) FOR PURPOSES OF THIS SECTION, IF MORE THAN ONE TYPE OF RADIONUCLIDE A, B,...N ARE PRESENT IN CONCENTRATIONS  $C_A, C_B, \dots, C_N$ , AND IF THE APPLICABLE DERIVED CONCENTRATION GUIDE (DCG) VALUES ARE  $DCG_A, DCG_B, \dots, DCG_N$  RESPECTIVELY, THEN THE CONCENTRATION SHALL BE LIMITED SO THAT THE FOLLOWING RELATIONSHIP IS SATISFIED:

$$(C_A/DCG_A) + (C_B/DCG_B) + \dots + (C_N/DCG_N) \leq 1.$$

(2) RELEASES OF TRITIUM NEED NOT BE CONSIDERED IN DETERMINING WHETHER A BAT IS REQUIRED BY THIS SECTION. LEAKAGE OR RELEASE OF TRITIUM TO THE ENVIRONMENT SHALL BE CONTROLLED IN A MANNER THAT HAS BEEN ESTABLISHED BY APPLICATION OF THE ALARA PROCESS.

(D) IF THE CONDITIONS IN EITHER §834.211(A)(2) OR §834.211(A)(3) ARE NOT SATISFIED, ALTERNATIVE TREATMENT METHODS SHALL BE INVESTIGATED TO DETERMINE THE BEST AVAILABLE TECHNOLOGY.

(1) A BEST AVAILABLE TECHNOLOGY (BAT) PLAN SHALL BE ESTABLISHED TO:

(i) DOCUMENT THE ANALYSIS OF WHETHER THE BAT IS REQUIRED AND, IF REQUIRED,

(ii) DOCUMENT THE BAT SELECTION PROCESS AND

(iii) SET FORTH THE SCHEDULE FOR INSTALLING THE BAT.

(2) SELECTED BAT ALTERNATIVES SHALL BE IMPLEMENTED IN ACCORDANCE WITH THE APPROVED SCHEDULES IN THE BAT PLAN WHICH SHALL BE INCLUDED DIRECTLY, OR BY REFERENCE, IN THE ERPP.

(3) THE BAT PROCESS SHALL BE USED AS PART OF THE DESIGN OF LIQUID WASTE TREATMENT STREAMS WHEN CONSTRUCTING NEW FACILITIES AND NEW ACTIVITIES.

(E) DOE ACTIVITIES HAVING A NATIONAL OR STATE POLLUTION DISCHARGE ELIMINATION SYSTEM PERMIT THAT INCLUDES RADIONUCLIDES DISCHARGED BY THOSE DOE ACTIVITIES AND OPERATING IN ACCORDANCE WITH THOSE PERMITS SHALL BE EXEMPT FROM §834.211 FOR PERMITTED SOURCES.

(F) DISCHARGES OF LIQUID WASTE FROM A DOE ACTIVITY SHALL NOT CAUSE A PRIVATE OR PUBLIC DRINKING WATER SYSTEM TO EXCEED THE DRINKING WATER RADIOLOGICAL LIMITS OF 40 CFR PART 141.

### **§834.212 DISCHARGES OF LIQUID WASTE TO AQUIFERS AND PHASEOUT OF SOIL COLUMNS.**

(A) UNLESS §834.212(C) IS APPLICABLE, NO NEW OR INCREASED DISCHARGE TO ACTIVE OR VIRGIN SOIL COLUMNS WILL BE PERMITTED, AND THE USE OF SOIL COLUMNS IN CONNECTION WITH A DOE ACTIVITY TO RETAIN, BY ABSORPTION, ION EXCHANGE, OR PHYSICAL ENTRAINMENT, SUSPENDED OR DISSOLVED RADIONUCLIDES FROM LIQUID WASTE STREAMS SHALL BE DISCONTINUED AS SOON AS PRACTICABLE, BUT NOT LATER THAN **[INSERT DATE---24 MONTHS AFTER THE EFFECTIVE DATE OF THIS RULE]**.

(B) SOIL COLUMNS, DRAINAGE SYSTEMS, GROUND WATERS, AND ANY OTHER AREAS TO WHICH RELEASES OF RADIOACTIVE MATERIAL IN LIQUIDS FROM A DOE ACTIVITY HAVE BEEN DISCONTINUED, SHALL BE MANAGED OR DECONTAMINATED IN A MANNER THAT:

(1) COMPLIES WITH ALARA PROCESS REQUIREMENTS;

(2) COMPLIES WITH THE APPLICABLE DOSE LIMITS; AND

(3) PROHIBITS ANY LIQUID DISCHARGE, INCLUDING UNCONTAMINATED LIQUID, THAT COULD SUBSTANTIALLY SPREAD PREVIOUSLY DEPOSITED RADIOACTIVE MATERIAL THROUGH THE SOIL COLUMN OR DIRECTLY IMPACT GROUND WATER, UNLESS IT CAN BE DEMONSTRATED THAT ALTERNATIVE ACTIONS WOULD HAVE A GREATER IMPACT OR RISK TO THE PUBLIC OR THE ENVIRONMENT THAN DISCHARGE TO THE SOIL COLUMN.

(C) THE REQUIREMENTS OF §834.212(A) DO NOT APPLY TO DISPOSAL OF LIQUID WASTE CONTAINING RADIONUCLIDES IN SOIL COLUMNS OR AQUIFERS WHERE THE LIQUID WASTE STREAM IS TREATED BY BAT, SELECTED AS A RESULT OF THE BAT SELECTION PROCESS, AND THE PRACTICE RESULTS IN A LESSER RISK OF ADVERSE IMPACTS ON HUMAN HEALTH OR ECOLOGICAL RESOURCES THAN ANY OTHER PRACTICAL ALTERNATIVE WASTE MANAGEMENT PRACTICE.

(1) EVALUATIONS OF ALTERNATIVE PRACTICES SHALL INCLUDE EACH OF THE FOLLOWING ELEMENTS:

(I) RISK ASSESSMENT TO DETERMINE PATHWAYS OF POTENTIAL EXPOSURE FOR EACH ALTERNATIVE UNDER CONSIDERATION AND TO ENSURE THAT DISCHARGE OF LIQUID WASTES TO SOIL COLUMNS OR AQUIFERS IS THE LOWEST RISK ALTERNATIVE.

(II) MIGRATION ASSESSMENT TO DETERMINE SUBSURFACE MIGRATION POTENTIAL AND TO QUANTIFY THE CARRYING CAPACITY OF THE SUBSURFACE FOR THE SPECIFIC LIQUID WASTE TO BE DISCHARGED.

(III) MONITORING TO DETERMINE ACTUAL CONCENTRATIONS OF RADIONUCLIDES IN SOIL COLUMNS AND AQUIFERS, AND TO ENSURE THAT CONCENTRATIONS DO NOT EXCEED LEVELS DETERMINED IN §834.212(C)(2)(I) AND (II) TO REPRESENT THE LOWEST RISK ALTERNATIVE.

(2) THE EVALUATION SHALL DEMONSTRATE THAT:

(I) ANY PRACTICE INVOLVING THE DISCHARGE OF LIQUID WASTE TO SOIL COLUMNS OR AQUIFERS DOES NOT ALLOW THE MOVEMENT OF FLUID CONTAINING A RADIOLOGICAL CONTAMINANT DERIVED FROM DOE ACTIVITIES INTO UNDERGROUND SOURCES OF DRINKING WATER, IF THE PRESENCE OF THAT CONTAMINANT MAY CAUSE A VIOLATION OF ANY PRIMARY DRINKING WATER REGULATION UNDER THE SAFE DRINKING WATER ACT (REF. 40 CFR PART 141).

(II) A PRACTICE INVOLVING THE DISCHARGE OF LIQUID WASTE TO SOIL COLUMNS OR AQUIFERS DOES NOT CAUSE WORKERS OR MEMBERS OF THE PUBLIC TO BE EXPOSED TO RADIATION OR RADIONUCLIDES GREATER THAN EXPOSURES FROM EXISTING WASTE MANAGEMENT PRACTICES.

(3)(I) A CONTINGENCY PLAN SHALL BE ESTABLISHED.

(II) THE CONTINGENCY PLAN SHALL BE FOLLOWED IF THE ACTUAL CONCENTRATIONS OF RADIONUCLIDES ARE DETERMINED TO BE IN EXCESS OF THE LEVELS DESCRIBED IN §834.212(C)(2)(I) AND (II).

(4) THE DEVELOPMENT OF ANY PRACTICE CONFORMING TO THE REQUIREMENTS OF THIS SECTION SHALL BE COORDINATED WITH EPA OR THE STATE, WHERE APPROPRIATE AUTHORITY HAS BEEN DELEGATED TO THE STATE BY EPA.

### **§834.213 DISCHARGES TO SANITARY SEWERAGE.**

(A) A DOE ACTIVITY SHALL BE CONDUCTED IN A MANNER SUCH THAT, EXCEPT FOR EXCRETA FROM PATIENTS TREATED WITH RADIOACTIVE MATERIAL, RADIONUCLIDES IN LIQUID WASTES DISCHARGED FROM THE DOE ACTIVITY INTO SANITARY SEWERS SHALL:

(1) CONSIST ONLY OF DISSOLVED MATERIALS OR READILY DISPERSED BIOLOGICAL MATERIALS;

(2) COMPLY WITH ALARA PROCESS REQUIREMENTS;

(3) BE TREATED BY THE BAT TO REDUCE THE CONCENTRATION LEVEL TO LESS THAN FIVE TIMES THE DCG VALUES FOR LIQUIDS, IF THE AVERAGE MONTHLY LEVEL OTHERWISE WOULD BE GREATER THAN

FIVE TIMES THE DCG VALUE AT THE POINT OF DISCHARGE; AND

(4) NOT RESULT IN AN ANNUAL DISCHARGE (ABOVE BACKGROUND) INTO PUBLIC SEWERS IN EXCESS OF

- (I) 5 Ci (200 GBQ) OF HYDROGEN-3,
- (II) 1 Ci (37 GBQ) OF CARBON-14, AND
- (III) 1 Ci (37 GBQ) TOTAL OF ALL OTHER RADIONUCLIDES.

(B) THE DISCHARGE OF LIQUID WASTES FROM A DOE ACTIVITY INTO A SANITARY SEWER SYSTEM OWNED BY THE FEDERAL GOVERNMENT SHALL NOT BE SUBJECT TO THE REQUIREMENTS OF §834.213(A)(2) AND §834.213(A)(3) OF THIS PART IF:

(1) THE SYSTEM PROVIDES TREATMENT IN ACCORDANCE WITH AN APPROVED ERPP, PRIOR TO DISCHARGE OF LIQUID WASTE TO SURFACE WATER; AND

(2) SLUDGE FROM THE SYSTEM IS DISPOSED OF IN ACCORDANCE WITH APPLICABLE FEDERAL REGULATIONS.

(C) THE FACILITY OPERATOR CONDUCTING THE DOE ACTIVITY SHALL EVALUATE AND DOCUMENT SUCH DISCHARGE TO THE SANITARY SEWER IN THE SITE ANNUAL REPORT AND PROVIDE COPIES OF THE REPORT TO APPROPRIATE LOCAL OFFICIALS.

(D) WHERE AGREEMENTS, CONTRACTS, STATEMENTS OF UNDERSTANDING, OR OTHER FORMAL ARRANGEMENTS BETWEEN FEDERAL OR STATE AGENCIES CONCERNING THE DISCHARGE OF RADIOACTIVE LIQUID WASTE TO SANITARY SEWERS ARE IN EFFECT AND THE RELEASES ARE IN CONFORMANCE WITH THOSE CONDITIONS, THE DOE ACTIVITY WILL BE DEEMED TO BE IN COMPLIANCE WITH THE REQUIREMENTS OF THIS SUBPART.

#### **§834.214 DRINKING WATER.**

(A) THE DRINKING WATER SYSTEM FOR A DOE ACTIVITY SHALL BE MANAGED IN A MANNER THAT COMPLIES WITH THE PROVISIONS OF 40 CFR PART 141 -- NATIONAL PRIMARY DRINKING WATER REGULATIONS PURSUANT TO SECTION 1412 OF THE SAFE DRINKING WATER ACT.

(B) DISCHARGES FROM DOE ACTIVITIES SHALL BE MANAGED IN A MANNER THAT WILL NOT CAUSE PRIVATE OR PUBLIC DRINKING WATER SYSTEMS DOWNSTREAM OR DOWN-GRADIENT OF THE FACILITY DISCHARGE TO EXCEED THE DRINKING WATER MAXIMUM CONTAMINATION LEVELS IN 40 CFR PART 141.

#### **§834.215 GROUND WATER.**

(A) A GROUND WATER PROTECTION MANAGEMENT PROGRAM (GWMP) SHALL BE ESTABLISHED TO PROTECT THE GROUND WATER FROM RADIOLOGICAL CONTAMINATION AND BE DESCRIBED OR INCLUDED IN THE ERPP OR INCLUDED BY REFERENCE TO A GWMP PLAN.

(B) THE GWMP PLAN SHALL:

- (1) DOCUMENT THE QUALITY AND QUANTITY OF GROUND WATER;
- (2) IDENTIFY POSSIBLE SOURCES OF CONTAMINATION, INCLUDING WASTE MANAGEMENT UNITS AND SOIL COLUMNS;
- (3) ASSESS THE POTENTIAL FOR RADIOLOGICAL CONTAMINATION OF THE GROUND WATER BY A DOE ACTIVITY;
- (4) DESCRIBE STRATEGIES FOR CONTROLLING CONTAMINATION, INCLUDING PREVENTIVE AND REMEDIAL MEASURES TO COMPLY WITH APPLICABLE FEDERAL ENVIRONMENTAL LAWS AND REGULATIONS;
- (5) DESCRIBE MEASURES FOR MONITORING THE GROUND-WATER; AND
- (6) BE COORDINATED WITH APPROPRIATE STATE REPRESENTATIVES.

#### **SUBPART E --- REQUIREMENTS APPLICABLE TO RADIOACTIVE WASTE**

**§834.221 RADIOACTIVE WASTE.**

(A) A DOE ACTIVITY SHALL BE CONDUCTED IN A MANNER SUCH THAT EXPOSURE OF MEMBERS OF THE PUBLIC TO RADIATION FROM RADIOACTIVE WASTE:

- (1) COMPLIES WITH ALARA PROCESS REQUIREMENTS; AND
- (2) DOES NOT EXCEED A TEDE OF 25 MREM (0.25 mSv) IN A YEAR FROM ALL EXPOSURE PATHWAYS AND RADIATION SOURCES, EXCEPT RADON AND ITS DAUGHTERS.

(B) RADON-222 GENERATING WASTES AND WASTES THAT EMIT RADON-220 SHALL BE MANAGED IN A MANNER THAT WILL COMPLY WITH THE REQUIREMENTS OF §834.306.

(C) THE ERPP SHALL INCLUDE, OR REFERENCE, DOCUMENTATION THAT DETAILS RADIOLOGICAL PROTECTION PLANS AND PROCEDURES TO MANAGE, STORE, AND DISPOSE OF RADIOACTIVE WASTE, INCLUDING LOW-LEVEL WASTE, HIGH-LEVEL WASTE, SPENT NUCLEAR FUEL, BY-PRODUCT MATERIAL, AS DEFINED IN SECTION 11(E)2 OF THE ACT, ACCELERATOR-PRODUCED MATERIAL, OR TECHNICALLY ENHANCED NATURALLY-OCCURRING RADIOACTIVE MATERIAL.

(D) THE WASTE MANAGEMENT SECTION OF THE ERPP FOR A DOE ACTIVITY SHALL INCLUDE DIRECTLY, OR BY REFERENCE, PLANS OR PROCEDURES THAT ADDRESS THE RADIOLOGICAL PROTECTION OF THE PUBLIC AND THE ENVIRONMENT, INCLUDING:

- (1) THE BASIS FOR CONTROLS TO ENSURE COMPLIANCE WITH THIS PART AND WITH APPLICABLE FEDERAL STATUTES AND REGULATIONS;
- (2) DESCRIPTIONS OF THE MEANS USED TO LIMIT ACCESS TO WASTE;
- (3) DESCRIPTIONS OF THE INTERIM AND LONG-TERM STRATEGIES FOR DEALING WITH WASTE;
- (4) DESCRIPTIONS OF THE ADMINISTRATIVE SAFEGUARDS;
- (5) DESCRIPTIONS OF THE MECHANISMS FOR COOPERATING WITH STATE AND LOCAL OFFICIALS;

AND

(6) REFERENCES FOR THE MANAGEMENT PROGRAMS THAT ENSURE COMPLIANCE WITH REQUIREMENTS HEREIN, I.E., PUBLIC DOSE LIMITS, PROPERTY RELEASE REQUIREMENTS, AND GROUND WATER PROTECTION REQUIREMENTS.

**SUBPART F --- REQUIREMENTS FOR THE PROTECTION OF BIOTA**

**§834.231 AQUATIC ORGANISMS.**

A DOE ACTIVITY SHALL BE CONDUCTED IN A MANNER SUCH THAT THE ABSORBED DOSE TO AQUATIC ANIMAL ORGANISMS (E.G., FISH, CRUSTACEANS, MOLLUSKS, AND BENTHIC INVERTEBRATES) WILL NOT EXCEED 1 RAD (0.01 GRAY) PER DAY FROM EXPOSURE TO RADIATION OR RADIOACTIVE MATERIAL DISCHARGED IN LIQUID WASTE TO NATURAL WATERWAYS.

**§834.232 TERRESTRIAL PLANTS. [RESERVED]**

**§834.233 TERRESTRIAL ANIMALS. [RESERVED]**

**SUBPART G --- RADIOLOGICAL PROTECTION REQUIREMENTS IN THE MANAGEMENT OF PROPERTY CONTAINING RESIDUAL RADIOACTIVE MATERIAL.**

**§834.301 RELEASE OF PROPERTY CONTAINING RESIDUAL RADIOACTIVE MATERIAL.**

(A) DOE PROPERTY OR PERSONAL PROPERTY CONTAINING RESIDUAL RADIOACTIVE MATERIAL SHALL NOT BE RELEASED FROM DOE CONTROL UNLESS:

- (1) THE RELEASE OF PROPERTY IS IN COMPLIANCE WITH AUTHORIZED LIMITS (§834.301(B)) AND SUPPLEMENTAL LIMITS (§834.301(D)) FOR CONCENTRATIONS OF RESIDUAL RADIOACTIVE MATERIAL ON



PROPERTY SURFACES OR INTERIOR;

(2) THE PROPERTY IS EVALUATED AND APPROPRIATELY SURVEYED TO IDENTIFY AND CHARACTERIZE CONTAMINATION WITHIN THE PROPERTY AND REMOVABLE RADIOACTIVE MATERIAL AND TOTAL RADIOACTIVE MATERIAL ON PROPERTY SURFACES (INCLUDING CONTAMINATION PRESENT ON AND UNDER ANY COATING); AND

(3) DOCUMENTATION, IN A DEPARTMENT-APPROVED FORMAT, IS COMPLETED THAT:

(I) DESCRIBES THE PROPERTY,

(II) DESCRIBES THE RADIOLOGICAL HISTORY OF THE PROPERTY,

(III) STATES THE CRITERIA FOR RELEASE OF THE PROPERTY AND THE BASES FOR THE CRITERIA WHICH HAVE BEEN APPROVED BY THE DEPARTMENT AND COORDINATED WITH APPROPRIATE STATE AND FEDERAL ORGANIZATIONS,

(IV) DESCRIBES ANY RESTRICTIONS ON USE OR DISPOSITION OF THE PROPERTY AND HOW THE IMPLEMENTATION OF THE RESTRICTIONS WILL BE ENSURED,

(V) DESCRIBES THE SURVEY OF THE PROPERTY, INCLUDING THE DATE, THE IDENTITY OF THE SURVEYOR, THE TYPES AND IDENTIFICATION NUMBERS OF THE INSTRUMENTS USED, AND THE RESULTS OF THE SURVEY,

(VI) INDICATES THE QUANTITY AND DISPOSITION OF THE WASTE RESULTING FROM ANY DECONTAMINATION EFFORT, AND

(VII) IDENTIFIES THE RECIPIENT OF THE PROPERTY, ITS DESTINATION, OR ITS DISPOSITION; AND

(4) APPROPRIATELY NOTIFIES THE RECIPIENT OR OWNER OF THE PROPERTY OF THE RESULTS OF THE SURVEY OF THE PROPERTY, INCLUDING THE AVAILABILITY OF DOCUMENTATION REQUIRED BY §834.301(A)(3).

(B) THE AUTHORIZED LIMITS SHALL BE DERIVED IN ACCORDANCE WITH THE ALARA PROCESS REQUIREMENTS, DOCUMENTED, APPROVED BY THE DEPARTMENT, AND MADE PART OF THE PUBLIC RECORD.

(C) EACH APPLICATION FOR DEPARTMENTAL APPROVAL OF AUTHORIZED LIMITS SHALL CONTAIN THE FOLLOWING INFORMATION:

(1) THE NATURE OF THE PROPERTY AND ITS POTENTIALLY RESTRICTED OR UNRESTRICTED USE;

(2) THE POTENTIAL COLLECTIVE DOSE TO THE EXPOSED POPULATION AND THE DOSE TO THOSE INDIVIDUAL MEMBERS OF THE PUBLIC MOST LIKELY TO RECEIVE THE HIGHEST DOSE IN THE ACTUAL AND LIKELY USE SCENARIO AND THE WORST PLAUSIBLE USE SCENARIO;

(3) THE COST AND IMPACT OF ACTIONS NECESSARY TO REDUCE LEVELS OF RESIDUAL RADIOACTIVE MATERIAL AND THE COST REDUCTION RESULTING FROM THE ACTION;

(4) OTHER FACTORS THAT RELATE TO THE ALARA PROCESS AND THE APPROVAL DECISIONS;

(5) THE LIMITS REQUESTED FOR RESIDUAL RADIOACTIVE CONTAMINANTS; AND

(6) THE MEASUREMENT AND EVALUATION TECHNIQUES PROPOSED TO DETERMINE COMPLIANCE WITH THESE LIMITS.

(D) THE DEPARTMENT MAY AUTHORIZE SUPPLEMENTAL LIMITS TO BE APPLIED TO THE RELEASE OF THAT PORTION OF THE PROPERTY FOR WHICH THE AUTHORIZED LIMITS ARE EITHER INAPPROPRIATE OR NOT PRACTICABLE TO APPLY. AN APPLICATION FOR SUPPLEMENTAL LIMITS SHALL INCLUDE A JUSTIFICATION THAT IS ADEQUATELY DOCUMENTED AND MADE A MATTER OF PUBLIC RECORD.

(E) JUSTIFICATIONS FOR SUPPLEMENTAL LIMITS SHALL BE BASED UPON ONE OF THE FOLLOWING:

(1) REMEDIAL ACTION CONSISTENT WITH AUTHORIZED LIMITS WOULD POSE A CLEAR AND PRESENT RISK OF INJURY TO WORKERS OR MEMBERS OF THE PUBLIC, NOTWITHSTANDING REASONABLE MEASURES TO AVOID OR REDUCE THE RISK; OR

(2) REMEDIAL ACTION CONSISTENT WITH AUTHORIZED LIMITS, EVEN AFTER ALL REASONABLE MITIGATIVE MEASURES HAVE BEEN TAKEN, WOULD PRODUCE ENVIRONMENTAL HARM (E.G., DESTRUCTION

OF ARTIFACTS, ECOLOGICAL DAMAGE, LOSS OF CULTURAL ASSETS) THAT IS CLEARLY EXCESSIVE COMPARED TO THE HEALTH BENEFITS TO PERSONS LIVING ON OR NEAR AFFECTED PROPERTIES, NOW OR IN THE FUTURE; OR

(3) IT IS DETERMINED THAT THE SCENARIOS OR ASSUMPTIONS USED TO ESTABLISH THE AUTHORIZED LIMITS DO NOT APPLY TO THE PROPERTY OR PORTION OF THE PROPERTY IDENTIFIED, OR WHERE MORE APPROPRIATE SCENARIOS OR ASSUMPTIONS INDICATE THAT OTHER LIMITS ARE APPLICABLE OR APPROPRIATE FOR PROTECTION OF THE PUBLIC AND THE ENVIRONMENT; OR

(4) THE COST OF REMEDIAL ACTION FOR CONTAMINATED SOIL IS UNREASONABLY HIGH RELATIVE TO LONG-TERM BENEFITS AND WHERE, AFTER TAKING NECESSARY CONTROL MEASURES, THE RESIDUAL MATERIAL DOES NOT POSE A CLEAR PRESENT OR FUTURE LIKELIHOOD OF EXCEEDING THE HEALTH PROTECTION LIMITS OF §§834.101(A), 834.201(B), AND 834.221(A)(2).

(F) A SUPPLEMENTAL LIMIT WILL ACHIEVE THE DOSE LIMIT AND ALARA PROCESS REQUIREMENTS OF THIS PART FOR ANY CURRENT OR FUTURE USE OF THE PROPERTY AND SHALL CONTAIN ANY RESTRICTION NECESSARY TO ACHIEVE THE OBJECTIVES OF THIS PART.

(G) REQUIREMENTS TO DOCUMENT RADIOLOGICAL SURVEY PROCEDURES, THE CRITERIA FOR RELEASE, PROPERTY IDENTIFICATION, AND OTHER REQUIREMENTS IN §834.301 SHALL BE SATISFIED BY INCLUSION (DIRECTLY OR BY REFERENCE) IN THE DOE-APPROVED ERPP, OF THE SURVEY PROTOCOLS, CRITERIA, AND TAGGING AND LABELING PROCEDURES, AND RECORD KEEPING REQUIREMENTS.

#### **§834.302 SOIL**

(A) AUTHORIZED LIMITS AND SUPPLEMENTAL LIMITS FOR ALL RADIONUCLIDES IN SOIL SHALL BE DERIVED USING APPROVED MODELS IN ACCORDANCE WITH THE REQUIREMENTS OF THIS SUBPART AND SELECTED ON THE BASIS OF THE ALARA PROCESS.

(B) AUTHORIZED LIMITS FOR RADIUM-226 AND RADIUM-228 SHALL BE SELECTED CONSISTENT WITH §834.302(A) AND SHALL NOT EXCEED 5 pCi/GRAM (0.2 Bq/GRAM) IN EXCESS OF BACKGROUND LEVELS, AVERAGED OVER 100 M<sup>2</sup>, IN THE FIRST 15 CM DEPTH OF THE SURFACE LAYER OF SOIL; AND 15 pCi/GRAM (0.56 Bq/GRAM) IN EXCESS OF BACKGROUND LEVELS, AVERAGED OVER ANY SUBSEQUENT 15 CM SUBSURFACE LAYER OF SOIL.

(C) WHERE RESIDUAL RADIOACTIVE MATERIAL CONSTITUTES A SOURCE OF RADON EMISSION, AN ALARA ASSESSMENTS SHALL INCLUDE THE EVALUATION OF INDOOR RADON DOSES FOR LIKELY-USE SCENARIOS AND COMPARISONS WITH THE REQUIREMENTS OF §834.303.

#### **§834.303 RADON.**

(A) REMEDIAL ACTIONS SHALL BE CONDUCTED ON HABITABLE AND OCCUPIED STRUCTURES WITH THE OBJECTIVE OF REDUCING RESIDUAL RADIOACTIVE MATERIAL LEVELS SUCH THAT THE ANNUAL AVERAGE RADON-222 DECAY PRODUCT CONCENTRATION WILL NOT EXCEED 0.02 WL [OR 4 pCi/L RADON, WHEN 0.02 WL IS APPROXIMATELY EQUIVALENT TO 4 pCi/L ASSUMING THAT THE RADON DECAY PRODUCTS ARE AT 50% OF EQUILIBRIUM], INCLUDING BACKGROUND, IN THE STRUCTURE.

(B) IF RESIDUAL RADIOACTIVE MATERIAL CANNOT BE REDUCED, PRACTICABLY, TO LEVELS THAT REDUCE RADON DECAY PRODUCT CONCENTRATION IN A HABITABLE STRUCTURE TO 0.02 WL, REMEDIAL MEASURES, INCLUDING ACTIVE CONTROLS, SHALL BE EMPLOYED TO REDUCE CONCENTRATIONS TO 0.03 WL, OR LESS. IN ANY CASE, THE RADON DECAY PRODUCT CONCENTRATION SHALL NOT EXCEED 0.03 WL, INCLUDING BACKGROUND, IN SUCH STRUCTURES AS A RESULT OF RESIDUAL RADIOACTIVE MATERIAL.

#### **§834.304 STRUCTURES.**

AUTHORIZED LIMITS AND SUPPLEMENTAL LIMITS FOR RESIDUAL RADIONUCLIDES IN OR ON STRUCTURES AT SPECIFIC DOE PROPERTIES SHALL BE

- (A) ESTABLISHED IN ACCORDANCE WITH THE REQUIREMENTS OF THIS SUBPART,
  - (B) CONSISTENT WITH DEPARTMENT GUIDELINES OR DERIVED USING DOE-APPROVED MODELS,
- AND
- (C) SELECTED ON THE BASIS OF THE ALARA PROCESS.

**§834.305 EQUIPMENT AND SMALL ITEMS.**

(A) AUTHORIZED LIMITS FOR RELEASE OF EQUIPMENT AND SMALL ITEMS INCLUDING PERSONAL PROPERTY SHALL BE ESTABLISHED ON THE BASIS OF THE ALARA PROCESS AND SHALL:

- (1) FOR NORMAL OPERATIONS, CONSIDER EXPECTED ANNUAL RELEASES OF PROPERTY FOR THE DOE FACILITY;
- (2) FOR SPECIFIC DOE REMEDIAL ACTION OR DECONTAMINATION AND DECOMMISSIONING ACTIVITIES, CONSIDER ALL RELEASES OVER THE LIFE OF THE PROJECT; AND
- (3) COMPLY WITH THE REQUIREMENTS OF THIS SUBPART.

**§834.306 CONTROL AND DISPOSITION OF RESIDUAL RADIOACTIVE MATERIAL.**

(A) THE FOLLOWING DOE ACTIVITIES SHALL BE CONDUCTED ACCORDING TO THE REQUIREMENTS OF §834.306(B), (C) AND (D):

- (1) THE CONTROL OF RESIDUAL RADIOACTIVE MATERIAL FROM DECONTAMINATION;
- (2) THE CLEANUP OF LAND AND BUILDINGS CONTAMINATED WITH RESIDUAL RADIOACTIVE MATERIAL FROM DOE OR INACTIVE PROCESSING SITES; AND
- (3) THE MANAGEMENT OF URANIUM AND THORIUM BYPRODUCT MATERIAL (NOT SUBJECT TO THE REQUIREMENTS OF 40 CFR PART 192, HEALTH AND ENVIRONMENTAL PROTECTION STANDARDS FOR URANIUM AND THORIUM MILL TAILINGS) AND NATURALLY OCCURRING AND ACCELERATOR PRODUCED RADIOACTIVE MATERIAL (NARM) RESIDUE OR WASTE RESULTING FROM DOE ACTIVITIES THAT CANNOT BE RELEASED IN ACCORDANCE WITH THE REQUIREMENTS OF THIS SUBPART.

(B) THIS SECTION OF 10 CFR PART 834 DOES NOT APPLY TO:

- (1) MANAGEMENT OF WASTE AND RESIDUE FROM DOE FACILITIES SUBJECT TO THE URANIUM MILL TAILINGS RADIATION CONTROL ACT OF 1978, WHICH SHALL INSTEAD BE MANAGED IN ACCORDANCE WITH APPLICABLE SECTIONS OF 40 CFR PART 192, AND
- (2) MANAGEMENT OF RESIDUE AND WASTE
  - (I) AT FACILITIES LICENSED BY THE NUCLEAR REGULATORY COMMISSION OR AN AGREEMENT STATE, OR
  - (II) AT APPROVED DOE LOW-LEVEL WASTE DISPOSAL SITES.

(C) A PROPERTY MAY BE MAINTAINED UNDER AN INTERIM MANAGEMENT ARRANGEMENT WHEN THE RESIDUAL RADIOACTIVE MATERIAL EXCEEDS AUTHORIZED LIMITS DEVELOPED FOR UNRESTRICTED RELEASE IF:

- (1) THE RESIDUAL RADIOACTIVE MATERIAL IS IN LOCATIONS WHICH ARE NOT READILY ACCESSIBLE TO MEMBERS OF THE PUBLIC;
- (2) THE RESIDUAL CONTAMINATION WOULD BE UNREASONABLY COSTLY TO REMOVE; AND
- (3) WHEN NEEDED, ADMINISTRATIVE CONTROLS ARE INSTITUTED BY THE OPERATING ORGANIZATION TO PROTECT MEMBERS OF THE PUBLIC.

(D)(1) APPROPRIATE ADMINISTRATIVE AND PHYSICAL CONTROLS FOR THE MANAGEMENT OF STORAGE OR DISPOSAL ACTIVITIES SHALL BE DEVELOPED, DOCUMENTED, AND IMPLEMENTED TO LIMIT ACCESS, USE, AND REMOVAL OF MATERIAL CONTAMINATED WITH RESIDUAL RADIOACTIVE MATERIAL.

(2) CONTROLS SHALL BE DESIGNED SUCH THAT CONCENTRATIONS OF RADIONUCLIDES IN THE GROUNDWATER AND RESIDUAL RADIOACTIVE MATERIAL WILL NOT CAUSE THE REQUIREMENTS OF THIS PART TO BE EXCEEDED.

(3) CONTROL AND STABILIZATION FEATURES FOR THE INTERIM MANAGEMENT AND STORAGE OF RESIDUAL RADIOACTIVE MATERIAL SHALL BE DESIGNED TO MEET THE APPLICABLE DOSE LIMITS AND DOSE CONSTRAINTS SELECTED THROUGH APPLICATION OF THE ALARA PROCESS FOR 25 YEARS AT A MINIMUM, AND 50 YEARS IF PRACTICABLE TO DO SO.

(4) THE CONTROLS SHALL BE DESIGNED TO LIMIT RADON CONCENTRATIONS IN THE ATMOSPHERE ABOVE FACILITIES TO LEVELS THAT WILL NOT EXCEED:

(I) AN ANNUAL AVERAGE RADON-220 AND RADON-222 CONCENTRATION OF 0.5 pCi (0.02 Bq)/L, ABOVE BACKGROUND, AT ANY OFFSITE LOCATION WHERE PERSONS ARE LIKELY TO RESIDE OR WORK;

(II) FLUX RATES FROM THE STORAGE OF RADON-PRODUCING WASTES OF 20 pCi (0.7 Bq)/(m<sup>2</sup> SEC), AVERAGED OVER THE AREA CONTAINING THE RADON-GENERATING MATERIAL

(E)(1) LONG-TERM MANAGEMENT OF RESIDUAL RADIOACTIVE MATERIAL IN RESIDUE AND WASTE FROM A DOE ACTIVITY SHALL BE IN ACCORDANCE WITH THIS SECTION AND DOE APPROVED PLANS.

(2) LONG-TERM MANAGEMENT OF THE RESIDUE AND WASTE SHALL BE CONDUCTED IN A MANNER THAT WILL:

(I) COMPLY WITH DOSE LIMITS (§834.201, §834.214, AND §834.221);

(II) COMPLY WITH THE ALARA REQUIREMENTS OF THIS PART (§834.104);

(III) COMPLY WITH THE GROUND-WATER PROTECTION MANAGEMENT PLAN (§834.215);

(IV) LIMIT RADON-222 EMANATION TO THE ATMOSPHERE FROM RADON-222 GENERATING WASTE TO LESS THAN AN ANNUAL AVERAGE RELEASE RATE OF 20 pCi (0.7 Bq)/(m<sup>2</sup> SEC) AVERAGED OVER THE SURFACE AREA OVERLYING THE WASTE, INCLUDING THE COVERING OR OTHER CONFINEMENT STRUCTURES;

(V) LIMIT RADON-220 EMANATION TO THE ATMOSPHERE FROM WASTE TO AN ANNUAL AVERAGE RELEASE RATE OF 20 pCi (0.7 Bq)/(m<sup>2</sup> SEC), AND

(VI) LIMIT INCREASES IN THE ANNUAL AVERAGE RADON-222 OR RADON-220 CONCENTRATION AT OR ABOVE ANY LOCATION OUTSIDE THE BOUNDARY OF THE CONTROLLED AREA TO 0.5 pCi (0.02 Bq)/L.

(3) CONTROL AND STABILIZATION FEATURES SHALL BE DESIGNED TO:

(I) BE EFFECTIVE FOR ONE THOUSAND YEARS, TO THE EXTENT REASONABLY ACHIEVABLE, AND, IN ANY CASE, FOR AT LEAST 200 YEARS;

(II) MINIMIZE UNAUTHORIZED PUBLIC ACCESS OR USE THAT MIGHT BREACH CONTAINMENT OF WASTE; AND

(III) PROVIDE FOR PROPER CONDITIONING OR BARRIERS TO CONTROL THE GENERATION AND ESCAPE OF BIOGENIC GASES FROM POTENTIALLY BIO-DEGRADABLE CONTAMINATED WASTE OR RESIDUE TO ENSURE THAT THIS MATERIAL WILL NOT CAUSE THE EMISSION LIMITS OR DOSE LIMITS TO BE EXCEEDED AND BIO-DEGRADATION WITHIN THE FACILITY WILL NOT RESULT IN PREMATURE STRUCTURAL FAILURE.

(4) IN THE DEVELOPMENT OF CONTROLS AND WASTE MANAGEMENT PLANS, WHERE APPROPRIATE, THE IMPACTS OF ALTERNATIVE DISPOSAL MODES SHALL BE EVALUATED BEYOND THE 1,000-YEAR DESIGN REQUIREMENT, TO 10,000 YEARS.

(5) FOR WASTES CONTAINING A HIGH SPECIFIC ACTIVITY (E.G.,  $\geq 1$  nCi/g) OF RADIUM OR THORIUM, ALTERNATIVE DISPOSAL METHODS, SUCH AS DEEP LAND DISPOSAL, PROTECTIVE COVERS (E.G., RIPRAP), CONCRETE VAULTS, OR GEOLOGIC REPOSITORIES THAT PROVIDE ADDITIONAL PROTECTION FROM POSSIBLE INADVERTENT INTRUSION SHALL BE EVALUATED AND EMPLOYED IF JUSTIFIED BY POTENTIAL RISK CONSIDERATIONS.

## **SUBPART H --- RECORDS AND REPORTS**

### **§834.401 RECORDS.**

(A) RECORDS SHALL BE MAINTAINED TO DOCUMENT COMPLIANCE WITH THE REQUIREMENTS OF THIS PART.

(B) UNLESS OTHERWISE SPECIFIED IN THIS SUBPART, RECORDS SHALL BE RETAINED UNTIL FINAL DISPOSITION IS AUTHORIZED BY THE DEPARTMENT.

(C) RECORDS OF INDIVIDUAL AND COLLECTIVE DOSE ESTIMATES SHALL BE MAINTAINED TO DOCUMENT ESTIMATED DOSES TO MEMBERS OF THE PUBLIC WHO ARE LIKELY TO RECEIVE DOSES FROM DOE ACTIVITIES OWING TO THEIR LOCATION OR DUE TO EXPOSURE PATHWAYS DURING NORMAL OPERATIONS, UNUSUAL OCCURRENCES OR EMERGENCY CONDITIONS.

(D) THE RECORDS REQUIRED BY THIS SECTION SHALL:

(1) IDENTIFY EXISTING OR ANTICIPATED DOE ACTIVITIES SUBJECT TO THE ERPP REQUIREMENTS [§834.5];

(2) DESCRIBE THE MEASURES TO BE USED IN IMPLEMENTING THE ERPP REQUIREMENTS;

(3) BE SUFFICIENT TO EVALUATE AND VERIFY COMPLIANCE WITH THE ERPP REQUIREMENTS;

(4) PROVIDE INFORMATION NECESSARY TO COMPLETE REPORTS REQUIRED BY THIS PART AND BY DEPARTMENTAL REQUIREMENTS FOR OCCURRENCE REPORTING AND PROCESSING (§834.404); AND

(5) CONTAIN THE MAGNITUDE OF THE DOSE CONTRIBUTIONS FROM RADIATION SOURCES OTHER THAN THOSE ASSOCIATED WITH THE DOE ACTIVITY WHEN THESE SOURCES MUST BE ASSESSED UNDER §834.102.

(E) REQUESTS FOR HIGHER DOSE LIMITS [§834.101(B)], SUPPORTING INFORMATION, AND SUBSEQUENT ACTIONS SHALL BE RECORDED AND MAINTAINED.

(F) ALL RECORDS REQUIRED BY THIS SECTION SHALL BE TRANSFERRED TO THE DEPARTMENT UPON CESSATION OF A DOE ACTIVITY AT A SITE.

(G) THE ADMINISTRATIVE INFORMATION TO BE DOCUMENTED AND MAINTAINED SHALL INCLUDE:

(1) RECORDS OF ACTIONS TAKEN TO IMPLEMENT THE ALARA PROCESS IN REGULATING EXPOSURES TO INDIVIDUALS AND MEMBERS OF THE PUBLIC, INCLUDING THE ACTIONS REQUIRED FOR THIS PURPOSE BY §834.104 SUCH AS RECORDS OF COST-BENEFIT OR OTHER ANALYSES, AND OTHER FACTORS WHICH WERE CONSIDERED TO BE IMPORTANT TO THE ALARA DECISION-MAKING PROCESS.

(2) RECORDS OF ACTIONS TAKEN TO IMPLEMENT THE BAT SELECTION PROCESS IN REGULATING LIQUID DISCHARGES, INCLUDING RECORDS TO DOCUMENT THE ANALYSES AND FACTORS THAT WERE CONSIDERED TO BE IMPORTANT, INCLUDING ALTERNATIVE PROCESSES, FOR THE BAT SELECTION PROCESS.

(H) THE EFFLUENT MONITORING AND ENVIRONMENTAL SURVEILLANCE INFORMATION [§834.7] TO BE DOCUMENTED AND MAINTAINED SHALL INCLUDE:

(1) RESULTS OF EFFLUENT MONITORING FOR DETERMINING SOURCES OF RADIATION AND RADIOACTIVE MATERIAL WHICH ARE SOURCES OF DIRECT EXPOSURES TO MEMBERS OF THE PUBLIC AND RELEASES OF RADIOACTIVE MATERIAL IN LIQUID OR AIRBORNE EFFLUENT, AS REQUIRED BY §834.7.

(2) RESULTS OF SURVEYS FOR RADIATION AND RADIOACTIVE MATERIAL IN THE ENVIRONMENT, AS REQUIRED BY §834.7.

(3) RESULTS OF SURVEYS, MEASUREMENTS, AND CALCULATIONS USED TO DETERMINE EXPOSURES OF INDIVIDUALS AND MEMBERS OF THE PUBLIC FROM EXTERNAL AND INTERNAL RADIATION SOURCES, AS REQUIRED BY §834.102.

(4) METEOROLOGICAL DATA ACQUISITIONS [§834.7(B)(3)], AND

(5) PREOPERATIONAL MONITORING [§834.7(B)(4)].

(I) THE RECORDS PERTAINING TO WASTE MANAGEMENT SHALL INCLUDE:

(1) RESULTS OF SURVEYS AND OTHER INFORMATION OBTAINED THROUGH THE GROUND WATER PROTECTION MANAGEMENT PROGRAM (GWMP) [§834.215]; AND

(2) INFORMATION OBTAINED THROUGH IMPLEMENTATION OF [§834.221(D)].

(J) THE INFORMATION PERTAINING TO THE RELEASE OF PROPERTY CONTAINING RESIDUAL RADIOACTIVE CONTAMINATION TO BE DOCUMENTED AND MAINTAINED SHALL INCLUDE:

(1) AUTHORIZED LIMITS, [§834.301(B)], FOR ROUTINE RELEASES OF PROPERTY FOR

UNRESTRICTED OR RESTRICTED USE AND THE SCENARIOS EVALUATED IN SELECTING THE LIMITS;

(2) SUPPLEMENTAL LIMITS, [§834.301(D)], FOR RELEASES OF PROPERTY APPLIED TO THE RELEASE OF THE PORTION OF THE PROPERTY FOR WHICH THE AUTHORIZED LIMITS ARE EITHER INAPPROPRIATE OR NOT PRACTICABLE TO APPLY; AND

(3) THE INFORMATION REQUIRED IN §834.301.

(K) DOCUMENTATION FOR THE INTERIM AND LONG-TERM MANAGEMENT OF WASTE AND RESIDUES INCLUDING THE INFORMATION NECESSARY TO DEMONSTRATE COMPLIANCE WITH §834.303(B).

(L)(1) ALL ELEMENTS OF THE ERPP SHALL BE ANALYZED TO IDENTIFY AND DOCUMENT WHERE AND HOW SPECIFIC QA REQUIREMENTS WILL BE APPLIED AND HOW THESE APPLICATIONS SHALL BE DOCUMENTED.

(2) RECORDS SHALL BE MAINTAINED TO DEMONSTRATE COMPLIANCE WITH THE QA PROGRAM REQUIREMENTS IN 10 CFR 830.120.

#### **§834.402 [RESERVED]**

#### **§834.403 [RESERVED]**

#### **§834.404 REPORTS.**

(A) THE REQUIREMENTS FOR REPORTING OCCURRENCES ARE PRESENTED IN SECTION 10 CFR 830.350, "CATEGORIZATION, NOTIFICATION, AND REPORTING OF OPERATIONAL OCCURRENCES AT DOE NUCLEAR FACILITIES," OF 10 CFR PART 830, "NUCLEAR SAFETY AT DOE NUCLEAR FACILITIES." IN ADDITION TO THE REQUIREMENTS OF 10 CFR PART 830, THE PERSON IN CHARGE OF A DOE ACTIVITY SHALL SUBMIT TO DOE:

(1) BY OCTOBER 1 ANNUALLY, A SITE ENVIRONMENTAL REPORT (SER) THAT DOCUMENTS:

(I) THE QUANTITIES OF RADIOACTIVE MATERIALS RELEASED DURING THE YEAR TO THE ENVIRONMENT,

(II) THE CALCULATED ANNUAL DOSE TO THE MAXIMALLY EXPOSED MEMBERS OF THE PUBLIC AND THE CALCULATED COLLECTIVE DOSE TO MEMBERS OF THE PUBLIC FROM EXPOSURES TO RADIATION SOURCES REGULATED UNDER THIS PART, AND

(III) RELEASES OF RADON AND ITS PROGENY (LISTED SEPARATELY) AND THE RESULTANT INDIVIDUAL AND COLLECTIVE DOSES FROM THESE RADIONUCLIDES, WHICH NEED NOT BE COMBINED WITH DOSES FROM OTHER SOURCES; AND

(2) WITHIN ONE MONTH OF THE DETERMINATION, A REPORT THAT DOCUMENTS ANY EVENT (INCLUDING THE RELEASE OF PROPERTY) THAT RESULTS IN DOSES TO MEMBERS OF THE PUBLIC OF

(I) A TEDE GREATER THAN 10 MREM (0.1 mSv), OR

(II) A COLLECTIVE TEDE GREATER THAN 100 PERSON-REM (1 PERSON-Sv).