

DLD(SPO3)

Re: SA-99-074

Robert J. Huston, *Chairman*
R. B. "Ralph" Marquez, *Commissioner*
John M. Baker, *Commissioner*
Jeffrey A. Saitas, *Executive Director*



TEXAS NATURAL RESOURCE CONSERVATION COMMISSION

Protecting Texas by Reducing and Preventing Pollution

November 8, 1999

Mr. Tom O'Brien
Office of State Programs
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Re: Request for Technical Information (SP-99-074) by November 8, 1999

Dear Mr. O'Brien:

As you requested on November 2, 1999, please find as attachments numbered one and two, responses from the Texas Natural Resource Conservation Commission (TNRCC) to questions, numbers 42 and 43 of the above-referenced Request for Technical Information.

Should you have any comments, or need additional information, please contact me at (512) 239-6846 (arogers@tnrcc.state.tx.us) at your convenience.

Sincerely,

A handwritten signature in cursive script, appearing to read "Alice Hamilton Rogers".

Alice Hamilton Rogers, PE, Manager
UIC and Radioactive Waste Section
Waste Permits Division

AHR/GF/jb

Attachments

cc: Mr. Richard Ratliff/TDH

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SP-A-4
SP-AG-27

ATTACHMENT NUMBER ONE

(SP-99-074)

QUESTION NUMBER 42

DEFINITIONS

RELATED TO THE RELEASE OF RADIOACTIVE MATERIAL

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DEFINITIONS RELATED TO THE RELEASE OF RADIOACTIVE MATERIAL

NRC Request for Technical Information, Nov. 2, 1999

As an agreement state, Texas, specifically the Texas Natural Resource Conservation Commission, is providing response to:

Question #42 "Provide the definitions for the following terms: waste; disposal; effluent; byproduct material; transfer; and release limits."

Key

TAC - Texas Administrative Code (state rules)

Chapter 305 - Consolidated Permits - general agency application process chapter that applies to radioactive materials, underground injection control, solid and hazardous waste and wastewater discharge

Chapter 336 - Radioactive Substance Rules

HSC - Texas Health and Safety Code (state statute)

Chapter 401 - Texas Radiation Control Act

TWC - Texas Water Code (state statute)

Chapter 26

Waste

30 TAC §336.2(56) **Low-level radioactive waste** - See "Radioactive waste." (Note: currently in rulemaking to be amended to be consistent with Texas Health & Safety Code 401.004)

30 TAC §336.2(64) **Naturally-occurring radioactive material (NORM) waste** - Solid, liquid, or gaseous material or combination of materials, excluding source material, special nuclear material, and byproduct material, that:

(A) in its natural physical state spontaneously emits radiation;

(B) is discarded or unwanted; and

(C) is not exempt under rules of the Texas Department of Health adopted under Health and Safety Code, §401.106.

30 TAC §336.2(82) **Radioactive waste** - Radioactive material other than byproduct material as defined in subparagraph (B) of the definition of "byproduct material" of this section,

uranium ore, NORM waste, or oil and gas NORM waste, that is discarded or unwanted and is not exempt under rules of the Texas Department of Health adopted under Health and Safety Code, §401.106, or would require processing before it could have beneficial reuse. For purposes of the rules in this chapter, radioactive waste also excludes waste classified as high-level radioactive waste, transuranic waste, or spent nuclear fuel. For purposes of the rules in this chapter, radioactive waste means "low-level radioactive waste" as that term is used in 10 CFR Part 61 as amended through May 9, 1995 (60 FedReg 24552) (relating to Licensing Requirements for Land Disposal of Radioactive Waste). For purposes of the rules in this chapter, "radioactive waste" and "low-level radioactive waste" are equivalent terms. For purposes of the rules in this chapter, radioactive waste and low-level radioactive waste include accelerator-produced radioactive material. (Note: currently in rulemaking to be amended to be consistent with Texas Health & Safety Code 401.004)

30 TAC §336.701 (22) **Waste** - Radioactive waste, or low-level radioactive waste, as defined in §336.2 of this title (relating to Definitions) which is acceptable for disposal in a land disposal facility. Notwithstanding the definitions in §336.2 of this title, the term "waste" as used in this subchapter includes transuranics in concentrations less than 10 nanocuries per gram, as provided in §336.701(b)(3) of this title (relating to Scope and General Provisions), and byproduct material which meets the limitations of §336.701(c) of this title. (Note: currently in rulemaking to be amended to be consistent with Texas Health & Safety Code 401.004)

HSC §401.004 **LOW-LEVEL RADIOACTIVE WASTE DEFINED.** (a) Except as provided by Subsection (b), "low-level radioactive waste" means radioactive material that:

(1) is discarded or unwanted and is not exempt by board rule adopted under Section 401.106;

(2) is waste, as that term is defined by 10 C.F.R. Section 61.2; and

(3) is subject to:

(A) concentration limits established under 10 C.F.R. Section 61.55, or compatible rules established by the department or commission, as applicable; and

(B) disposal criteria established under Title 10, Code of Federal Regulations, or established by the department or commission, as applicable.

(b) "Low-level radioactive waste" does not include:

(1) high-level radioactive waste as defined by 10 C.F.R. Section 60.2;

(2) spent nuclear fuel as defined by 10 C.F.R. Section 72.3;

(3) by-product material described by Section 401.003(3)(B);

(4) naturally occurring radioactive material waste that is not oil and gas NORM waste; or

(5) oil and gas NORM waste.

Disposal

There is no definition of "disposal" in 30 TAC §336.2 (Note: This section is currently in rulemaking to be amended for consistency with Texas Health & Safety Code 401.003(8)).

30 TAC §336.702 (6) **Disposal** - The isolation of radioactive waste from the biosphere inhabited by man and containing his food chains by emplacement in a land disposal facility.

30 TAC §305.2 **Disposal** - The discharge, deposit, injection, dumping, spilling, leaking, or placing of any solid, liquid, or hazardous waste into or on any land, or into or adjacent to any water in the state so that such waste or any constituent thereof may enter the environment or be emitted into the air or discharged into or adjacent to any waters, including groundwaters. disposal (Note: currently the only applicable definition for NORM waste)

HSC §401.003(8) "Disposal" means, with regard to low-level radioactive waste, isolation or removal of low-level radioactive waste from mankind and mankind's environment without intent to retrieve that low-level radioactive waste later. The term does not include emissions and discharges under department rules.

Effluent

There is no definition in radiation rules, ch. 33.

30 TAC §305.2 **Effluent limitation** - Any restriction imposed on quantities, discharge rates, and concentrations of pollutants which are discharged from point sources into waters in the state.

Byproduct material

30 TAC §336.2(13) **Byproduct material** -

(A) A radioactive material, other than special nuclear material, that is produced in or made radioactive by exposure to radiation incident to the process of producing or using special nuclear material; and

(B) The tailings or wastes produced by or resulting from the extraction or concentration of uranium or thorium from ore processed primarily for its source material content, including discrete surface wastes resulting from uranium solution extraction processes, and other tailings having similar radiological characteristics. Underground ore bodies depleted by these solution extraction processes do not constitute "byproduct material" within this definition.

HSC §401.003(3) "**By-product material**" means:

(A) a radioactive material, other than special nuclear material, that is produced in or made radioactive by exposure to radiation incident to the process of producing or using special nuclear material; and

(B) tailings or wastes produced by or resulting from the extraction or concentration of uranium or thorium from ore processed primarily for its source material content, including discrete surface wastes resulting from uranium solution extraction processes.

Transfer

There is no definition in radiation rules

Release Limits

There is no definition in radiation rules

ATTACHMENT NUMBER TWO

(SP-99-074)

QUESTION NUMBER 43

RADIOLOGICAL CRITERIA
THAT PERTAIN TO UNRESTRICTED RELEASE OF SOLID MATERIALS

QUESTION NUMBER 43

RADIOLOGICAL CRITERIA THAT PERTAIN TO UNRESTRICTED RELEASE OF SOLID MATERIALS

NRC Request for Technical Information, Nov. 2, 1999

As an agreement state, Texas, specifically the Texas Natural Resource Conservation Commission, is providing response to:

Question #43 "What radiological criteria pertain to the unrestricted release of solid materials under state standards?"

The following are the regulations and guidance used by the TNRCC for determination of unrestricted release:

30 TAC §336.603 Radiological Criteria for Unrestricted Release

(a) A site will be considered acceptable for unrestricted use if the residual radioactivity that is distinguishable from background radiation results in a total effective dose equivalent (TEDE) to an average member of the critical group that does not exceed 25 mrem (0.25 mSv) per year (excluding radium and its decay products), including that from groundwater sources of drinking water, and the residual radioactivity has been reduced to levels that are as low as reasonably achievable (ALARA). The concentration for radium in soil shall be equivalent to or below the limits set forth in §336.356(a) of this title (relating to soil and vegetation contamination limits).

30 TAC §336.356 Soil and Vegetation Contamination Limits

(a) No licensee may possess, receive, use, or transfer licensed radioactive material in such a manner as to cause contamination of soil or vegetation in unrestricted areas that causes a member of the public to receive a total effective dose equivalent in excess of 25 mrem/year from all pathways (excluding radium and its decay products) and to the extent that the contamination exceeds the background level by more than:

(1) for radium-226 or radium-228 in soil, the following limits, based on dry weight, averaged over any 100 square meters of area:

(A) 5 picocuries/gram (pCi/g), averaged over the first 15 centimeters of soil below the surface;

(B) 15 pCi/g, averaged over each 15-centimeter thick layer of soil below the first 15 centimeters below the surface; and

(2) for radium-226 or radium-228 in vegetation, 5 pCi/g, based on dry weight.

(b) Notwithstanding the limits set forth in subsection (a) of this section, each licensee shall make every reasonable effort to maintain any contamination of soil or vegetation as low as is reasonably achievable (ALARA).

(c) If contamination caused by the licensee is detected in an unrestricted area, the licensee shall decontaminate any unrestricted area which is contaminated above the limits specified in subsection (a) of this section.

30 TAC §336.605 Surface Contamination Limits for Facilities, Equipment, and Materials

(a) Before vacating any facility or releasing any facility, equipment, or materials for unrestricted use, each licensee shall ensure that radioactive contamination has been removed to levels as low as is reasonably achievable.

(b) No licensee may vacate a facility or release a facility, equipment, or materials for unrestricted use until radioactive surface contamination levels are below the limits specified in §336.364, Appendix G, of this title (relating to Acceptable Surface Contamination Levels). The licensee shall conduct radiation surveys and provide reports and documentation to demonstrate that the requirements for release have been met. The executive director may also require the licensee to provide other information as may be necessary to demonstrate that the facilities and equipment are suitable for release.

(c) In addition to meeting the surface contamination limits of subsection (b) of this section, porous materials (e.g., concrete), which are to be released for unrestricted use, shall be evaluated to determine whether radioactive materials have penetrated to the interior of the material. If radioactive contamination has penetrated into the material, analysis of the average concentration, in picocuries per gram, shall be made. The material may be released for unrestricted use if the radionuclide concentrations do not exceed the limits specified for soil in §336.356(a) of this title (relating to Soil and Vegetation Contamination Limits) and §336.603 of this title (relating to Radiological Criteria for Unrestricted Use).

30 TAC §336.364 Appendix G. Acceptable Surface Contamination Levels

Acceptable Surface Contamination Levels

<u>Radionuclide</u> ¹	<u>Average</u> ^{2,3,6}	<u>Maximum</u> ^{2,4,6}	<u>Removable</u> ^{2,3,5,6}
U-natural, U-235, U-238, and associated decay products except Ra-226, Th-230, Ac-227, and Pa-231	5,000 dpm alpha/ 100 square cm	15,000 dpm alpha/100 square cm	1,000 dpm alpha/100 square cm
Transuranics, Ra-223, Ra-224, Ra-226, Ra-228, Th-natural, Th-228, Th-230, Th-232, U-232, Pa-231, Ac-227, Sr-90, I-125, I-126, I-129, I-131, and I-133	1,000 dpm/ 100 square cm	3,000 dpm/ 100 square cm	200 dpm/ 100 square cm
Beta-gamma emitters (radionuclides with decay modes other than alpha emission or spontaneous fission) except Sr-90 and others noted above	5,000 dpm beta-gamma/ 100 square cm	15,000 dpm beta-gamma 100 square cm	1,000 dpm beta-gamma 100 square cm

1. Where surface contamination by both alpha- and beta-gamma-emitting radionuclides exists, the limits established for alpha-and beta-gamma-emitting radionuclides should be applied independently.

2. As used in this appendix, dpm (disintegrations per minute) means the rate of emission by radioactive material as determined by correcting the counts per minute observed by an appropriate detector for background, efficiency, and geometric factors associated with the instrumentation.

3. Average contamination level shall not be measured over more than 1 square meter. For objects of less surface area, the average shall be derived for each object.

4. The maximum contamination level applies to an area of not more than 100 square

centimeters (cm²).

5. The amount of removable radioactive material per 100 cm² of surface area shall be determined by wiping that area with dry filter or soft absorbent paper, applying moderate pressure, and assessing the amount of radioactive material on the wipe with an appropriate instrument of known efficiency. When removable contamination on objects of less surface area is determined, the pertinent levels shall be reduced proportionally and the entire surface shall be wiped.

6. The average and maximum radiation levels associated with surface contamination resulting from beta-gamma emitters shall not exceed 0.2 millirad/hour at 1 cm and 1.0 millirad/hour at 1 cm, respectively, measured through not more than 7 milligrams/cm² of total absorber.

TNRCC Technical Guidance: Guidelines for Conducting Close-out Surveys of Open Lands and Requesting Release for Unrestricted Use.

Incorporates the above standards in a procedural document for performing close-out surveys.