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DRAFT WORKING DOCUMENT

As of 02/01/00

EXCERPTED AGREEMENT STATE RESPONSES TO

SP-99-074, REQUEST FOR TECHNICAL INFORMATION

Note:

The enclosed excerpts are from Agreement State responses to SP-99-074 which, in part, requested information to assist NRC in responding to question #43 from Dingell letter. State responses to question #1(of the six outlined in SP-99-074) are included as appropriate.

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INDISTINGUISHABLE FROM BACKGROUND

Illinois

For the release (i.e., transfer, disposal or relocation) of soils and other solid materials, the Department's objective is that the radiological character of the materials be indistinguishable from background. Generally, the licensee must demonstrate that the radiological characteristics of the materials fall within the range of statistical variation expected in similar materials without a radiological "history." Building materials *(gypsum, stone, brick, etc.)* can be segregated from dissimilar materials, and a different standard applied for each. On a case-by-case basis, the Department establishes, by literature research, the range of naturally-occurring radioactivity found in each type of material. Materials meeting Department-established standards can be categorized by the Department as unregulated materials, and may be disposed of without regard to their radiological characteristics. Materials exceeding the standards are categorized as LLRW.

Kansas

Kansas regulations only allow the transfer of radioactive material to persons licensed to receive it. Therefore, licensees cannot release either surficial or volumetric contaminated solid materials for unrestricted use.

Maine:

On a case by case basis we feel that we may be legally justified in a release of solid materials, though we have not had time for our Attorney General to review this question. We never have released for unrestricted use any materials in the past.

Nevada:

Our release standards for solid material is taken from the regulation definition in Nevada Administrative Code (NAC) 459.085 for "release for unrestricted use" and as implied in NRC Reg. Guide 1.86. Our radiological criteria for release of solid material is a background release criteria that applies to all media. Since there is no quantified level higher than background levels, etc., the concept is directly applicable to all materials. Adopted by the Nevada State Board of Health, the background level release concept is associated with background radiation exposure levels necessary to make a land parcel, piece of equipment or other object available for unrestricted use where exposure is not subject to radiation control standards or requiring the item or property to be considered a restricted area as a result of the radiation exposure/contamination. The multiple responses were intended to confirm that Reg Guide 1.86 or anything else can be used to achieve background levels. It's not either/or; it's clearly interpreted as background with process approval by the agency upon review of what the licensee submits.

REGULATORY GUIDE 1.86 EQUIVALENT

California

Historically, California has used its equivalent of Regulatory Guide 1.86 for the release of facilities and equipment with surface contamination.

Florida

Florida uses NRC guidance documents to determine whether radioactive materials can be released for unrestricted use. This includes but is not limited to NRC guidance documents such as Regulatory Guide 1.86 and computer models such as RESRAD, DandD and EPA's COMPLY. We evaluate the applicability of these modes and their strengths and weaknesses on a case-by-case basis.

Georgia

Georgia has and at this time continues to uses Reg Guide 1.86 when determining the suitability of solid materials for release for unrestricted use. No differentiation between surficial and volumetric contamination.

Kentucky

In the interim we make decisions at scrapyards, landfills, etc. on a case by case basis. We have used and continue to use Reg. Guide 1.86 as guidance.

Louisiana

The only criteria we have for the release of solid material are the criteria in NRC Reg Guide 1.86.

Mississippi

The State of Mississippi utilizes the NRC regulatory guides, such as Regulatory Guide 1.86. At least one licensee has referenced Table 1: "Acceptable surface contamination levels," from this guide in their procedures as the acceptable limits for the decommissioning of their facility. We have also referenced this table in our NORM regulations in Section 801.N.

New Hampshire

(c) No licensee shall allow surfaces or surfaces of objects contaminated to levels in excess of the values specified in Table 4021.1 **(NRC NOTE: table 4021.1 is equivalent to RG 1.86)**, to be released to unrestricted areas.

New Mexico

NRC Regulatory Guide 1.86 is used by reference for surface contaminants. Release of soil and effluents were adopted as regulation in compatibility with applicable NRC regulations.

REGULATORY GUIDE 1.86 EQUIVALENT

Nebraska

Nebraska has no NORM specific release criteria. Nebraska generally follows NRC criteria with the exception of releases to landfills where we have cloned the Texas criteria. Although we have not had an opportunity to exercise these criteria; if a chance arose we would certainly use Regulatory Guide 1.86 in the process.

North Carolina

For guidance, the NRC criteria as stated in Reg Guide 1.86 is used to determine when solid material may be released for unrestricted use. Our goal is to release only those materials and facilities that have no activity that is distinguishable above background. When laboratory data is available the NRCP test between the differences in two means is used, i.e., background mean vs sample mean. For other monitoring instruments, our standard has been material can be released if the activity is not distinguishable above background. In particular, this is that the readings are not above twice background. This guidance is applied on a case-by-case basis with professional health physics judgement that the amount of radioactivity involved in sufficiently low as to not be of any public health and safety or environmental concern. No specific criteria exist to differentiate between surficial and volumetric contamination.

Ohio

Ohio has adopted the same release limits that were adopted by NRC in Subpart E of 10 CFR 20. Anything contaminated with radioactive material that is removed from a site is low-level radioactive waste. Following Section 3748.10 of the Ohio Revised Code, such material (i.e., whatever was used to decontaminate the object and that is now contaminated as a result of the process as being low-level radioactive waste) must be disposed at a facility that is licensed to receive and dispose low-level radioactive waste. Decontamination of objects is done using NRC guidelines. The objects are inspected and released in accordance with NRC guidelines. Ohio's criteria regarding surficial and volumetric contamination differentiate to the same extent that NRC Regulatory Guide 1.86 differentiates between these types of contamination. Ohio also uses NRC Regulatory Guide 1.86 in decision-making regarding disposition of certain resources contaminated with radioactive materials.

Oregon

Oregon uses Reg Guide 1.86 to determine the unrestricted release limits of solid materials.

Rhode Island

NRC criteria contained in the 1987 NRC Guidelines for Contamination of Facilities and Equipment have been used for ordinary license terminations. No specialized release criteria such as for soils or other bulk materials have been used.

REGULATORY GUIDE 1.86 EQUIVALENT

Tennessee

US NRC Regulatory Guide 1.86 and Policy and Guidance PG-8-08 are used for the release of dirt, resins, asphalt, concrete, metals, and other wastes from licensed activities.

In the statement above, we indicate several specific types of wastes are commonly released following a demonstration that the referenced criteria had been met. Such releases are primarily made by facilities licensed to process and dispose of radioactive materials, although other types of licensees may also obtain such authorizations. These authorizations are issued following review of the protocol to be utilized by the licensee to characterize the level of contamination in the material proposed for release, and to determine that the measurement techniques proposed are adequate to verify compliance with the selected criteria. The term "other wastes" was included for the sake of completeness, but can, in fact, include any material that can be adequately characterized and verified as meeting the criteria.

Washington

As for guidance, we use NRC NUREGs and other NRC documents (such as NRC's Policy and Guidance Directive FC 83-23). Any license authorizations not tied directly to the existing Washington regulations would be based on NRC guidance or NRC standard license condition.

OTHER APPROACHES

Alabama:

Up until NUREG/CR 5849 was released, we used Reg. Guide 1.86. I might add that we have been involved in contamination clean-ups. In every case we have consulted with NRC staff and followed NRC's recommendations. For NORM, CRCPD's "NORM Commissions Guides" are being used on a case-by-case basis. These guides apply to all types of radioactive material.

Arizona

Arizona uses the same standards as the NRC for determining release limits which are specified in the Arizona Administrative Code equivalent to 10 CFR 20.2001 through 20.2007.

Arkansas

To date, the Department has not been required to determine acceptable release limits for radioactive material other than NORM. Any request for the unrestricted release of radioactive material other than NORM would be reviewed in light of applicable, current Nuclear Regulatory Commission (NRC) Guidance. These reviews would be performed on a case-by-case base. Reference will also be made to the Exempt Concentrations in RH-902, Schedule C. **NRC note: RH-902, schedule C appears to be equivalent to 10 CFR 30.70 Schedule A.**

The Department's NORM soil release limits are detailed in the Arkansas Rules and Regulations for Control of Sources of Ionizing Radiation (RH-6010.c.) Here, the Radium-226 or Radium-228 in soil averaged over any 100 square meters can not exceed background by more than 5 pCi/g, averaged over the first 15 cm of soil below the surface and 15 pCi/g averaged over 15 cm thick layers of soil more than 15 cm below the surface.

California

Volumetric releases have been based upon a concentration equivalent to the 10 CFR Part 20 values for water converted to grams rather than volume, indistinguishable from background, or a life-time fatal cancer risk of 10E-6.

Under our AEA derived authority there has been no release for recycling authorized. Both recycling releases that California has "concurred" in have been from Department of Energy national laboratories. These were based upon sampling, analyses, and dose modeling that demonstrated a "worst case" TEDE well below 1 millirem per year to the maximally exposed individual.

Colorado

Prior to the 25 mrem/yr standard for unrestricted release, we had used Reg. Guide 1.86. Now we use a 25 mrem/yr as a maximum dose, with an ALARA requirement. As appropriate, we use MARSSIM and RESRAD to assist in the evaluation. On a case-by-case basis, Colorado has authorized the disposal of items contaminated with or containing radioactive materials - both byproduct material and NORM.

OTHER APPROACHES

Iowa

Our release criteria are the same found in 10 CFR 20 Subpart E.

Kentucky

For soils we use the both the 25 mrem/yr and 15 mrem/yr release limit depending on the situation. If it is the Paducah Gaseous Diffusion Plant we assess ARARs and then use the 15 mrem/yr because it is a CERCLA site and the limit would be applicable whereas the 25 mrem/yr would be relevant and appropriate. For scrap metal at the Paducah Gaseous Diffusion Plant we expect the DOE to use appropriate release criteria developed by federal or international agencies.

In the interim we make decisions at scrapyards, landfills, etc. on a case by case basis. We have used and continue to use Reg. Guide 1.86 as guidance. We also use a risk release criteria of 1E-4. We have the capability of use ResRad-Baseline, ResRad, and ResRad-Building.

Maryland

In Maryland, other than effluent releases allowed under COMAR 26.12.01.01Appendix B of Section D (10 CFR Part 20 Appendix B), no disposal of specifically licensed radioactive material into the public domain is authorized except for the following. By license condition, Neutron Products, Inc. is allowed to have up to 8 pCi/gm in soil in the public domain prior to the requirement for clean up. Once cleaned up the Co-60 must be disposed of at an authorized radioactive material disposal facility. Should a request be received Maryland uses Regulatory Guide 1.86 as a basis for case by case evaluations that emphasize ALARA, evaluations of risk factors and final destination of materials.

Massachusetts

We do not differentiate between "surficial, or volumetric contamination". The release criterion is simply dose based in that the licensee, registrant, or person possessing non-exempt sources of radiation shall decontaminate the premises in such a manner that the annual total effective dose equivalent (TEDE) to any individual after the site is released for unrestricted use should not exceed ten millirem above background and that the annual TEDE from any specific environmental source during decommissioning activities not exceed ten millirem above background.

New Mexico:

Oil and gas NORM release criteria were adopted as regulation through consideration of other agreement state regulations, and with input from industry and the approval of the New Mexico Radiation Technical Advisory Council. The release criteria is 50 μR/hr including background for contaminated equipment, sludges, and scale. For soil, the release criteria is 30 pCi/gm above background for ^{226}Radium, and 150 pCi/gm above background for all other NORM constituents.

OTHER APPROACHES

New York

NYSDOH

Radioactive materials with half-lives of 90 days or less, held for decay-in-storage (DIS). The criteria are that these materials be held for 10 half-lives and prior to disposal, surveyed to determine that its radioactivity cannot be distinguished from background. Note: This is not exactly "unrestricted" release since the materials should be disposed as "normal waste." However this doesn't prohibit recycling. Any equipment or facility that has a surface that has a surface contamination of less than the specified value in Table 7 of Appendix 16-A of Part 16. The surface contamination limit from Table 7 for the release of materials or facilities is Alpha: 2,500 (max), 500 (avg) dpm/100 cm2 and Beta: 0.2 mR/hr and 1,000 dpm/100 cm2 removable.

Other scenarios are evaluated on a case-by-case basis. The department utilizes available programs such as RESRAD to estimate potential doses to critical members of the public from such a release. Normally for situations involving the decommissioning of contaminated lands, the department will work with the NYSDEC to make a determination on acceptable release concentrations and restrictions, if necessary. For these evaluations, the 10 mrem/yr guidance developed by DEC is used. For any requests for the recycling of contaminated materials, the department would use other guidance such as those developed by ICRP, NCRP and IAEA (e.g., 1mrem/yr dose to a member of the public) prior to making any determination on release.

NRC Note: NYSDOH indicates they are currently evaluating a licensee request to release several tons of copper containing small amounts of radioactive material.

NYDOL

The release of solid materials from facilities licensed by the New York State Department of Labor is done on a case-by-case basis in accordance with Industrial code Rule 38, Section 38.23 (b). This requires that before any property suspected of being contaminated is released, it must be decontaminated to the limits specified in Table 5 of Section 38.41. It further requires that a radiological survey of the property be submitted and accepted as demonstrating that any residual contamination is as low as reasonably achievable before the property can be released. **NRC Note: Table 5 is equivalent to RG 1.86 with the exception noted below:**

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	Average:	1,000 dpm/100 cm^2
	Maximum:	3,000 dpm/100 cm2
	Removable:	200 dpm/100 cm2

OTHER APPROACHES

NYDEC

The only solid material that DEC releases for unrestricted use is soil on sites that are remediated to remove radioactive contaminants. The criterion(<10 mrem/yr and ALARA excluding background) is set by a guidance document, Cleanup Guideline for Soils Contaminated with Radioactive Materials, Division of Solid & Hazardous Materials Technical Administrative Guidance memorandum 4003 ("TAGM 4003").

NYCDOH

Our regs don't have any radiological criteria for the unrestricted release of solid materials. We would defer to DEC in this area. Our other radiological criteria are derived from existing regulations in 10 CFR 20 and applied by licensing actions where licensees are required to adopt contamination criteria and action levels in our licensing guides.

North Dakota

Alpha emitters removable =	100 dpm/100cm2
Alpha emitters fixed (average/maximum) =	1000/5000 dpm/100cm2
Beta/gamma removable (except H-3) =	1110 dpm/100cm2
H-3 removable =	11,100 dpm/100cm2

They also use the following criteria for alpha, beta, and gamma emitters:

Total(fixed) $\frac{2.5\ \mu Sv}{hr} = \frac{(0.25\ mrem)}{hr}$ maximum at 1 cm from surface

Concentration in soil and other materials except water: (1) Radioactive material except source material and radium; Schedule A, column II of chapter 33-10-03. **NRC Note: Schedule A is similar to 10 CFR 30.70, Schedule A, "Exempt Concentrations"** (2) Source material and radium in soil: Concentration of radionuclides above background concentrations for total radium, averaged over areas of 100 square meters, shall not exceed: (i) 5 picocuries per gram of dry soil, averaged over the first 15 centimeters below the surface; and (ii) 5 picocuries per gram or dry soil, averaged over layers of 15 centimeters thickness more than 15 centimeters below the surface. (3) Source material and radium in other materials: Concentration of radionuclides above background concentrations for total radium shall not exceed 5 picocuries per gram.

The level of gamma radiation measured at a distance of 100 centimeters from the surface shall not exceed background.

OTHER APPROACHES

South Carolina

South Carolina has not approved any materials for unrestricted use. We have approved alternate methods of disposal under the state equivalent to 10 CFR 20.2002. These have been approved on a case-by-case basis using a dose criteria of 1 millirem per year to the maximally exposed individual. Some very low activity materials have been approved for disposal in industrial landfills and RCRA disposal cells.

South Carolina has performed evaluations on a case-by-case basis to develop criteria for alternate methods of disposal and for decommissioning. They have been developed using the RESRAD family of code. For alternate methods of disposal, the maximum annual dose which has been used is 15 millirem, which is consistent with the 25 millirem decommissioning standard and applies to ALARA.

Texas

TNRCC

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);

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.

OTHER APPROACHES

(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).

NRC Note: 30 TAC §336.364 Appendix G. Acceptable Surface Contamination Levels is equivalent to RG 1.86 with the exception noted below:

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	Average:	1,000 dpm/100 cm^2
	Maximum:	3,000 dpm/100 cm2
	Removable:	200 dpm/100 cm2

TDH

(3) Notwithstanding the limits set forth in subsections (ddd) and (eee) of this section, contamination levels must be maintained in unrestricted areas so that no individual member of the public will receive an effective dose equivalent in excess of 100 mrem (1 mSv) above background per year.

(4) No licensee shall vacate a facility or land, or release a facility or land for unrestricted use, until the annual total effective dose equivalent to a member of the public resulting from radioactive material remaining from licensed activities (excluding radium and its decay products) does not exceed 25 mrem (0.25 mSv) per year above background. The concentration for radium in soil shall be equivalent to or below the limits in subsection (eee) of this section. Notwithstanding the limits in this paragraph, each licensee shall make every reasonable effort to maintain any contamination of soil or vegetation ALARA. The licensee shall conduct all necessary radiation surveys and modeling and shall provide reports and documentation to demonstrate that the requirements for release for unrestricted use have been met. The Agency may require the licensee to provide any other information necessary to demonstrate that the facilities and land are suitable for release for unrestricted use.

OTHER APPROACHES

(ddd) Soil contamination limits.

(1) No licensee shall possess, receive, use, or transfer radioactive material in such a manner as to cause contamination of soil in unrestricted areas, to the extent that the contamination exceeds, on a dry weight basis, the concentration limits specified in:

(A) subsection (ggg)(8) of this section; or

(B) the effluent concentrations in Table III of subsection (ggg)(2) of this section, with the units changed from microcuries per milliliter to microcuries per gram, for radionuclides not specified in subsection (ggg)(8) of this section or paragraph (3) of this subsection.

(2) Where combinations of radionuclides are involved, the sum of the ratios between the concentrations present and the limits specified in paragraph (1) of this subsection shall not exceed one.

(eee) Surface contamination limits for facilities and equipment.

(1) Prior to vacating any facility or releasing areas or equipment for unrestricted use, each licensee shall ensure that radioactive contamination has been removed to ALARA levels. In no case shall the licensee vacate a facility or release areas or equipment for unrestricted use until radioactive surface contamination levels are below the limits specified in subsection (ggg)(6) of this section.

(2) In addition to meeting the surface contamination limits of paragraph (1) of this subsection, porous materials (e.g., concrete), that 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 pCi/g, shall be made. The material may be released for unrestricted use if the radionuclide concentrations do not exceed the limits specified for soil in subsection (ddd) of this section.

(fff) (4) Any licensee may, upon agency approval of procedures required in paragraph (6) of this subsection, discard licensed material included in subsection (ggg)(7) of this section, provided that it does not exceed the concentration and total curie limits contained therein, in a Type I municipal solid waste site as defined in the Municipal Solid Waste Regulations of the authorized regulatory agency (31 TAC Chapter 330), unless such licensed material also contains hazardous waste, as defined in Section 3(15) of the Solid Waste Disposal Act, Health and Safety Code, Chapter 361. Any licensed material included in subsection (ggg)(7) of this section and which is a hazardous waste as defined in the Solid Waste Disposal Act may be discarded at a facility authorized to manage hazardous waste by the authorized regulatory agency.

(ggg) Appendices

(6) Acceptable surface contamination levels. **NRC Note: (ggg)(6) Acceptable Surface Contamination Levels is equivalent to RG 1.86 with the exceptions noted below:**

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	Average:	1,000 dpm/100 cm^2
	Maximum:	3,000 dpm/100 cm2
	Removable:	200 dpm/100 cm2

(7) Concentration and activity limits of nuclides for disposal in a Type I municipal solid waste site or a hazardous waste facility (for use in subsection (fff) of this section).

Utah

Utah makes use of guidance and license authorizations for radiological criteria pertaining to the unrestricted release of solid materials. For objects with superficial contamination, we have used the values contained in NRC Regulatory Guide 1.86. Our experience with volumetric contamination in materials, other than soils, is limited to flue dust from an electric arc furnace and splash condenser dross residue from a high temperature sinter process. In both cases, the contaminant was cesium-137. The unrestricted release level we approved, before the NRC Technical Position on Incident Related Material, was 5.0 picocuries per gram.

AGREEMENT STATES

RELEASE CRITERIA AND DEFINITIONS

Agreement State	Release Criteria and Definitions
ALABAMA Release Criteria:	Up until NUREG/CR 5849 was released, we used Reg. Guide 1.86. I might add that we have been involved in contamination clean-ups. In every case we have consulted with NRC staff and followed NRC's recommendations. For NORM, CRCPD's "NORM Commissions Guides" are being used on a case-by-case basis. These guides apply to all types of radioactive material.
Definitions:	**Waste** is defined in Rule 420-3-26-.01(2)(a)114 of Alabama Radiation Protection Rules (ARCR). The definition is consistent with the 10 CFR 61.2 definition. **Disposal** is not defined in ARCR. However, the "authorized methods of disposal" are listed in Rule 420-3-26-.03(33)(a). The rule is equivalent to 10 CFR 20.2001(a). It does not contain the thoughts captured by the 10 CFR 61.2 definition of "disposal. **Byproduct material** is defined in Rule 420-3-26-.01(2)(a)17. The definition is consistent with the 10 CFR 30.4 definition , except that the ARCR definition also includes mill tailings from uranium and thorium ore extraction.
ARIZONA Release Criteria:	Arizona uses the same standards as the NRC for determining release limits which are specified in the Arizona Administrative Code equivalent to 10 CFR 20.2001 through 20.2007.
Definitions:	The definition of **Waste** refers to "low-level waste." Low level waste means waste material which contains radioactive nuclides in concentrations or quantities which exceed applicable standards for unrestricted release but does not include: (1) High-level waste, such as irradiated reactor fuel, liquid waste from reprocessing irradiated reactor fuel, or solids into which such liquid waste has been converted. (2) Waste material containing transuranic elements which contamination levels greater than 10 nanocuries per gram (370) kilobecquerels per kilogram) of waste material. (3) The tailings or wastes produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material content. **Byproduct material**: (a) 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; and (b) The tailings or wastes produced by 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. Underground operations do not constitute by-product material within this definition **Effluent Release:** Any disposal or release of radioactive material into the ambient atmosphere, soil, or any surface or subsurface body of water.
ARKANSAS Release Criteria:	The Arkansas Department of Health's experience base related to the release of solid materials (including soil) has been exclusively limited to Naturally Occurring Radioactive Materials (NORM). Yet, in this particular area, the Department has gained extensive experience. The Department's NORM soil release limits are detailed in the Arkansas Rules and Regulations for Control of Sources of Ionizing Radiation (RH-6010.c.) Here, the Radium-226 or Radium-228 in soil averaged over any 100 square meters can not exceed background by more than 5 pCi/g, averaged over the first 15 cm of soil below the surface and 15 pCi/g averaged over 15 cm thick layers of soil more than 15 cm below the surface. These particular release limits were developed by the Conference of Radiation Control Program Directors (CRCPD) Groups (i.e., Suggested State Regulations (SSR), Part N) and by other NORM Ad Hoc Working Groups. The bases for these particular levels apparently were derivations from the application of 10CFR Part 20 equivalent concentration limits for the unrestricted release of water containing either Radium 226 or Radium 228.

Agreement State	Release Criteria and Definitions
	The Department's NORM equipment release limits are also described in the Arkansas Rules and Regulations for Control of Sources of Ionizing Radiation (RH-6010.b. and Appendix A entitled "Acceptable Surface Contamination Levels for NORM). These limits were also established in the CRCPD SSR process. It should be noted that the Department's next revision of its Rules and Regulations will reflect the current SSR Part N Appendix A equivalent. The limits established in the most current SSR Appendix are less stringent than currently in the Arkansas NORM regulations. To date, the Department has not been required to determine acceptable release limits for radioactive material other than NORM. Any request for the unrestricted release of radioactive material other than NORM would be reviewed in light of applicable, current Nuclear Regulatory Commission (NRC) Guidance. These reviews would be performed on a case-by-case base. Reference will also be made to the Department's Exempt Concentrations in RH-902, Schedule C
Definitions:	**By-product material** is defined as "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."
CALIFORNIA Release Criteria:	Historically, California has used its equivalent of Regulatory Guide 1.86 for the release of facilities and equipment with surface contamination. Volumetric releases have been based upon a concentration equivalent to the 10 CFR Part 20 values for water converted to grams rather than volume, indistinguishable from background, or a life-time fatal cancer risk of 10E-6. At the present time the facility release criteria is the NRC standard of all-pathway dose of 25 millirems per year TEDE. Under our AEA derived authority there has been no release for recycling authorized. Both recycling releases that California has "concurred" in have been from Department of Energy national laboratories. These were based upon sampling, analyses, and dose modeling that demonstrated a "worst case" TEDE well below 1 millirem per year to the maximally exposed individual.
Definitions:	Since California has adopted 10 CFR Parts 20 and 61 by reference the terms: waste, disposal, and byproduct material are defined as they are in those parts of 10 CFR. Similarly the terms: effluent, release limits, and transfer are undefined and therefore have no meaning outside the normal meaning of those words.
COLORADO Release Criteria:	Prior to the 25 mrem/yr standard for unrestricted release, we had used Reg. Guide 1.86. Now we use a use 25 mrem/yr as a maximum dose, with an ALARA requirement. As appropriate, we use MARSSIM and RESRAD to assist in the evaluation. On a case-by-case basis, Colorado has authorized the disposal of items contaminated with or containing radioactive materials - both byproduct material and NORM. In regard to whether the contamination was surficial or volumetric, if surficial we require that the surface be cleaned ALARA prior to release. In evaluating impacts from any release or disposal, we perform calculations on the total amount of material present.
Definitions:	**Byproduct material** means (a) 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, (b) the tailings or wastes produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material content. **Disposal** means the isolation of low-level radioactive waste from the biosphere inhabited by man and his food chains by emplacement in a land disposal facility with no intention of retrieval. **Waste** means those low-level radioactive wastes that are acceptable for disposal in a land disposal facility. For the purposes of this definition, low-level waste has the same meaning as in the Low-Level Radioactive Waste policy Act, P.L. 96-573, as amended by P.L. 99-240, effective January 15, 1986; that is, radioactive waste (a) not classified as high-level radioactive waste, spent nuclear fuel, or byproduct material as defined in Section 11e.(2) of the Atomic Energy Act (uranium or thorium tailings and waste),

Agreement State	Release Criteria and Definitions
	and (b) classified as low-level radioactive waste consistent with existing law and in accordance with (a) above by the U.S. Nuclear Regulatory Commission.
FLORIDA Release Criteria: Definitions:	Florida uses NRC guidance documents to determine whether radioactive materials can be released for unrestricted use. This includes but is not limited to NRC guidance documents such as Regulatory Guide 1.86 and computer models such as RESRAD, DandD and EPA's COMPLY. We evaluate the applicability of these modes and their strengths and weaknesses on a case-by-case basis. **Radioactive waste** means any equipment or materials which are radioactive or have radioactive contamination and which are required pursuant to any governing laws, regulations, or licenses to be stored, treated, or disposed of as radioactive waste. The term "radioactive waste" is further defined as follows: (a) "High-level waste" means irradiated reactor fuel, liquid wastes from reprocessing irradiated reactor fuel, and solids into which such liquid wastes have been converted; (b) "Low-level waste" means radioactive waste not classified as high-level radioactive waste, transuranic waste, spent nuclear fuel, or byproduct material as defined in s. 11e.(2) of the Atomic Energy Act of 1954; (c) "Transuranic waste" means material containing transuranic elements with contamination levels greater than 10 nanocuries per gram of waste. **Byproduct material** *means:* (a) Any radioactive material, except special nuclear material, yielded in the process of producing or utilizing special nuclear material; and (b) The tailings or wastes produced by the extraction or concentration of uranium or thorium from ore processed primarily for its source material content, including discrete surface waste resulting from uranium or thorium solution extraction operations do not constitute byproduct material within this definition.
GEORGIA Release Criteria: Definitions:	Georgia has and at this time continues to uses Reg Guide 1.86 when determining the suitability of solid materials for release for unrestricted use. No differentiation between surficial and volumetric contamination. **Waste** means those low-level radioactive wastes that are acceptable for disposal in a land disposal facility. *For the purposes of this definition, low-level waste has the same meaning as in the Low-Level Radioactive* Waste policy Act, P.L. 96-573, as amended by P.L. 99-240, effective January 15, 1986; that is, radioactive waste (a) not classified as high-level radioactive waste, spent nuclear fuel, or byproduct material as defined in Section 11e.(2) of the Atomic Energy Act (uranium or thorium tailings and waste), and (b) classified as low-level radioactive waste consistent with existing law and in accordance with (a) above by the U.S. Nuclear Regulatory Commission. **Byproduct material** means: (1) 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; and (2) The tailings or wastes produced by the extraction or concentration of uranium or thorium from ore processed primarily for its source material content, including discrete surface wastes resulting from uranium or thorium solution extraction processes. Underground ore bodies depleted by these solution extraction operations do not constitute "byproduct material" within this definition.
ILLINOIS Release Criteria	Title 32 Illinois Administrative Code (32 IAC) "SECTION 340.APPENDIX A Decontamination Guidelines." No distinction is made regarding material types (medical, pipe scale, etc); only the physical forms are specified ("air", "water", "soil and other materials.") The following references were used in the development of the guidelines: Regulatory Guide 1.86 "Health Physics Considerations in Decontamination and Decommissioning", (Health Physics Society, Midyear Symposium, 1986) Papers - Development of Residual Radioactivity Criteria - National and International Considerations of a De Minimis Dose - Dose Guidelines for Decontamination and Decommissioning Projects - A Manual for Implementing Residual Radioactivity Guidelines - Residual Surface Contamination Limits: Problems in Interpretation and Implementation - Legal and Ethical Issues Raised in Considering Residual Decontamination Options for Technologically-Enhanced Radioactive Contamination - Public Information Experience in the Uranium Mill Tailings Remedial Action (UMTRA) Project

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- Decontamination and Decommissioning of a Luminous Dial Painting Facility: Radiological Characterization, Segregation and Disposal of Building Materials

ÿ 40 CFR 192 (10 CFR 40 Appendix)

ÿ ANSI documents developed by HPS Standards Committee

SUBPART K: WASTE DISPOSAL

Section 340.1010 General Requirements

a) A licensee shall dispose of licensed material only:-

1) By transfer to an authorized recipient as provided in Section 340.1060 or in 32 Ill. Adm. Code 330, 332 or 601, or to the U.S. Department of Energy; or

2) By release in effluents within the limits in Section 340.310; or

3) As authorized pursuant to Sections 340.1020, 340.1030, 340.1040 or 340.1050.

SUBPART N: ADDITIONAL REQUIREMENTS

Section 340.1320 Removal of Radioactive Contamination

Notwithstanding any exemptions contained in this Part, any person who uses, possesses, or stores radioactive material in such a manner as to cause uncontrolled contamination of any area shall, upon order of the Department, remove or provide for the removal of such contaminants at his own expense through the use of an authorized transferee and shall decontaminate the installation to the lowest practicable level. Unless another value is specified in 32 Ill. Adm. Code 332, the values specified in Section 340.Appendix A may be used as guidelines for this purpose. These values, however, may be modified at specific installations at the discretion of the Department.

SECTION 340.APPENDIX A Decontamination Guidelines

a) Surface Contamination Guide

Alpha Emitters:

Removable	555	mBq per 100 cm^2 =	average
15	pCi per 100 cm^2 =		over any
33	dpm per 100 cm^2		one surface
1.67	Bq per 100 cm^2 =		maximum
45	pCi per 100 cm^2 =		
100	dpm per 100 cm^2		
Total	16.7	Bq per 100 cm^2 =	average
(fixed)	450	pCi per 100 cm^2 =	over any
1,000	dpm per 100 cm^2		one surface
83.3	Bq per 100 cm^2 =		maximum
2,250	pCi per 100 cm^2 =		
5,000	dpm per 100 cm^2		
2.5	microSv per hour at 1 cm from surface =		
250	*microrem per hour at 1 cm from surface*		

Beta-Gamma Emitters:

Removable	3.7	Bq per 100 cm^2 =	average
(all beta-gamma	100	pCi per 100 cm^2	over any
emitters except		one surface	
hydrogen-3)			
18.5	Bq per 100 cm^2 =		maximum
500	pCi per 100 cm^2		
Removable	37	Bq per 100 cm^2 =	average
(hydrogen-3)	1,000	pCi per 100 cm^2	over any
one surface			
185	Bq per 100 cm^2 =		maximum
5,000	pCi per 100 cm^2		
Total	2.5	microSv per hour at 1 cm from surface =	
(fixed)	250	microrem per hour at 1 cm from surface	

b) Concentration in air and water: Appendix B, Table I and II of 10 CFR 20.

c) Concentrations in soil and other materials except water:

1) Radioactive material except source material and radium: Column II of 32 Ill. Adm. Code 330.Appendix A.

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	2) Source material and radium: Concentration of radionuclides above background concentrations for total radium, averaged over areas of 100 square meters, shall not exceed: A) 185 mBq (5 pCi) per gram of dry soil, averaged over the first 15 centimeters below the surface; and B) 185 mBq (5 pCi) per gram of dry soil, averaged over layers of 15 centimeters thickness more than 15 centimeters below the surface. d) The level of gamma radiation measured at a distance of 100 centimeters from the surface shall not exceed background. AGENCY NOTE: This Appendix shall be used only as a guide. The Department may require lower values in specific instances, depending upon radionuclides, type of surface, intended present and future use, etc.
Definitions:	Byproduct material" means: (1) 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; and (2) the tailings or wastes produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material content, including discrete surface wastes resulting from underground solution extraction processes but not including underground ore bodies depleted by such solution extraction processes. (See Section 4(a) of the Act.) "Disposal" means the isolation of radioactive wastes from the biosphere inhabited by persons and their food chains by emplacement in a land disposal facility. "Waste" means those low-level radioactive wastes that are acceptable for disposal in a land disposal facility. For the purposes of this definition, low-level waste has the same meaning as in the Low-Level Radioactive Waste Policy Act (P.L. 96-573, as amended by P.L. 99-240, effective January 15, 1986), i.e., radioactive material that (A) is not high-level radioactive waste, spent nuclear fuel, or byproduct material (as defined in section 11e.(2) of the Atomic Energy Act of 1954 (42 U.S.C. 2014(e)(2))); and (B) the Nuclear Regulatory Commission, consistent with existing law and in accordance with (A) above, classifies as low-level radioactive waste.
IOWA Release Criteria:	Our release criteria are the same found in 10 CFR 20 Subpart E.
Definitions:	**Byproduct material** means: (1) 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, and (2) the tailings or wastes produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material content, including discrete surface wastes resulting from uranium or thorium solution extraction processes. Underground ore bodies depleted by these solution extraction operations do not constitute "by-product material" within this definition.
KANSAS Release Criteria:	Kansas regulations only allow the transfer of radioactive material to persons licensed to receive it. Therefore, licensees cannot release either surficial or volumetric contaminated solid materials for unrestricted use.
Definitions:	**Waste:** Those low-level radioactive wastes that are acceptable for disposal in a land disposal facility. For the purposes of this definition, low-level waste shall have the same meaning as in the low-level radioactive waste policy act, P.L. 96-573, as amended by P.L. 99-240, effective January 15, 1986; that is, radioactive waste: (1) not classified as high-level radioactive waste, spent nuclear fuel, or byproduct material as defined in section 11e.(2) of the atomic energy act, uranium or thorium tailings and waste; and (2) classified as low radioactive waste consistent with existing law and in accordance with (1) by the U.S. nuclear regulatory commission. **Byproduct material:** (1) 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

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	material; and (2) the tailings or wastes produced by the extraction or concentration of uranium or thorium from ore processed primarily for its source material content, including discrete surface wastes resulting from uranium or thorium solution extraction processes. Underground ore bodies depleted by these solution extraction operations shall not constitute "byproduct material" within this definition.
KENTUCKY Release Criteria:	For soils we use the both the 25 mrem/yr and 15 mrem/yr release limit depending on the situation. If it is the Paducah Gaseous Diffusion Plant we assess ARARs and then use the 15 mrem/yr because it is a CERCLA site and the limit would be applicable whereas the 25 mrem/yr would be relevant and appropriate. For scrap metal at the Paducah Gaseous Diffusion Plant we expect the DOE to use appropriate release criteria developed by federal or international agencies. In the interim we make decisions at scrapyards, landfills, etc. on a case by case basis. We have used and continue to use Reg. Guide 1.86 as guidance. We have a portable high purity germanium (HPGe)detector system which we use in the field to identify material and make release decisions, if possible. We also use a risk release criteria of 1E-4. We have the capability of use ResRad-Baseline, ResRad, and ResRad-Building.
Definitions:	**Waste** (see "low-level radioactive waste") "Low-level radioactive waste" means radioactive waste not classified as high-level radioactive waste, transuranic waste, spent nuclear fuel, or by-product material as defined in Section 11e(2) of the Atomic Energy Act of 1954 (42 USC 2014). **Disposal** means the disposition of waste as authorized by 902 KAR 100:021. **By-product material** means: (a) 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; and (b) The tailings or wastes produced by 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. Underground ore bodies depleted by these solution extraction operations shall not constitute by-product material within this definition. **Disposal** means the isolation of radioactive wastes from the biosphere inhabited by man and his food chains by emplacement in a land disposal facility. **Waste** means those low-level radioactive wastes that are acceptable for disposal in a land disposal facility.
LOUISIANA Release Criteria:	The only criteria we have for the release of solid material are the exempt concentration and exempt quantity tables, which are identical to the NRC's.
Definitions:	We have no definitions for effluent, transfer, and release limits. Our definitions for waste, disposal, and byproduct material are identical to the NRC definitions.
MAINE Release Criteria:	On a case by case basis we feel that we may be legally justified in a release of solid materials, though we have not had time for our Attorney General to review this question. We never have released for unrestricted use any materials in the past.
Definitions	**Waste** means those low-level radioactive wastes that are acceptable for disposal in a land disposal facility. For the purposes of this definition, low-level waste has the same meaning as in the Low-Level Radioactive Waste Policy Act, P.L. 96-573, as amended by P.L. 99-240, effective January 15, 1986; that is, radioactive waste (a) not classified as high-level radioactive waste, spent nuclear fuel, or byproduct material as defined in Section 11e.(2) of the Atomic Energy Act (uranium or thorium tailings and waste) and (b) classified as low-level radioactive waste consistent with existing law and in accordance with (a) by the U.S. Nuclear Regulatory Commission. **Byproduct material** means (a) 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

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	nuclear material, (b) the tailings or wastes produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material content, including discrete surface wastes resulting from uranium or thorium solution extraction processes. Underground ore bodies depleted by these solution extraction operations do not constitute "byproduct material" within this definition.
MASSACHUSETTS Release Criteria:	We do not differentiate between "surficial, or volumetric contamination". The release criterion is simply dose based as stated below in our regulation, 105 CMR 120.291: 120.291: Vacating Premises Each licensee, registrant, or person possessing non-exempt sources of radiation shall, no less than 30 days before vacating or relinquishing possession or control of premises which may have been contaminated with radioactive material as a result of his activity, notify the Agency, in writing, of the intent to vacate. When deemed necessary by the Agency, the licensee, registrant, or person possessing non-exempt sources of radiation shall decontaminate the premises in such a manner that the annual total effective dose equivalent (TEDE) to any individual after the site is released for unrestricted use should not exceed ten millirem above background and that the annual TEDE from any specific environmental source during decommissioning activities not exceed ten millirem above background.
Definitions:	**Waste** means low-level radioactive waste. Low-level radioactive waste means radioactive material that: (1) is neither high-level waste, nor spent nuclear fuel, nor by-product material as defined in Section 11(e)(2) of the Atomic Energy Act of 1954, as amended, 42 U.S.C. §2014(e); and (2) is classified by the Federal Government as low-level radioactive waste, but not including waste which remains a Federal responsibility, as designated in Section 3(b) of the Low-Level Radioactive Waste Policy Act, as amended, 42 U.S.C. §2021c(b), as in effect as of December 8, 1987. **Disposal** means the isolation of low-level radioactive waste from the biosphere inhabited by human beings and their food chains. **Byproduct material** means: (1) 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; and (2) The tailings or wastes produced by the extraction or concentration of uranium or thorium from ore processed primarily for its source material content, including discrete surface wastes resulting from uranium or thorium solution extraction processes. Underground ore bodies depleted by these solution extraction operations do not constitute "byproduct material" within this definition. We do not have explicit definitions for "effluent," "transfer" and "release limits."

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MISSISSIPPI Release Criteria:	The State of Mississippi utilizes the NRC regulatory guides, such as Regulatory Guide 1.86. At least one licensee has referenced Table 1: "Acceptable surface contamination levels," from this guide in their procedures as the acceptable limits for the decommissioning of their facility. We have also referenced this table in our NORM regulations in Section 801.N.
Definitions:	**Waste** means: Those low-level radioactive wastes that are acceptable for disposal in a land disposal facility. For the purposes of this definition, low-level waste has the same meaning as in the Low-Level Radioactive Waste Policy Act, P.L. 96-573, as amended by P.L. 99-240, effective January 15, 1986; that is, radioactive waste (a) not classified as high-level radioactive waste, transuranic waste, spent nuclear fuel, or byproduct material as defined in Section 11e.(2) of the Atomic Energy Act (uranium or thorium tailings and waste) and (b) classified as low-level radioactive waste consistent with existing law and in accordance with (a) by the U.S. Nuclear Regulatory Commission. **Byproduct material** means: (1) 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; and (2) the tailings or wastes produced by the extraction or concentration of uranium or thorium from ore processed primarily for its source material content, including discrete surface wastes resulting from uranium or thorium solution extraction processes. Underground ore bodies depleted by these solution extraction operations do not constitute "byproduct material" within this definition.
NEVADA Release Criteria	Our release standards for solid material is taken from the regulation definition in Nevada Administrative Code (NAC) 459.085 for "release for unrestricted use" and as implied in NRC Reg. Guide 1.86. Our radiological criteria for release of solid material is a background release criteria that applies to all media. Since there is no quantified level higher than background levels, etc., the concept is directly applicable to all materials.
Definitions:	Waste - text to be telefaxed for definitions in Nevada Administrative Code (NAC) 459.8055 and Nevada Revised Statute (NRS) 459.007, Article 2.G. Disposal - text to be telefaxed for definition in NAC 459.802 Effluent - use colloquial definition used in common conversation Byproduct material - text to be telefaxed for definition in NRS 459.010 Transfer - use colloquial definition used in common conversation Release limits - see text to be telefaxed for definition for "released for unrestricted use" in NAC 459.085.
NEW HAMPSHIRE Release Criteria:	Portions of the NHRCR allow for unrestricted release of solid material as follows: **He-P 4023.04** Treatment or Disposal by Incineration. A licensee may treat or dispose of licensed material by incineration only in the form and concentration specified in He-P 4023.05 or as specifically approved by the DHHS/BRH pursuant to He-P 4023.02. **He-P 4023.05 Disposal of Specific Wastes.** (a) A licensee shall dispose of the following licensed material as if it were not radioactive: (1) 1.85 kBq (0.05 µCi), or less, of hydrogen-3 or carbon-14 per gram of medium used for liquid scintillation counting; and (2) 1.85 kBq (0.05 µCi), or less, of hydrogen-3 or carbon-14 per gram of animal tissue, averaged over the weight of the entire animal.

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(b) A licensee shall not dispose of tissue having been treated with radioactive material pursuant to He-P 4023.05(a)(2) in a manner that would permit its use either as food for humans or as animal feed.

(c) The licensee shall maintain records in accordance with He-P 4021.09

He-P 4021.20 Additional Requirements.
(a) Each specific licensee shall, no less than 30 days before vacating or relinquishing possession or control of premises which may have been contaminated with radioactive material as a result of licensee's activities, notify the DHHS/BRH in writing of intent to vacate.

(b) If in the course of a survey as required by He-P 4022.01, a licensee should find a surface contaminated to levels in excess of the values specified in Table 4021.1, [Column 1,] the licensee shall immediately institute measures to reduce the contamination to the levels specified.

(c) No licensee shall allow surfaces or surfaces of objects contaminated to levels in excess of the values specified in Table 4021.1, to be released to unrestricted areas.

(d) Where surface contamination by both alpha and beta-gamma emitting isotopes exists, the limits established for alpha and beta-gamma emitting isotopes shall apply independently.

(e) The radioactivity on the interior surfaces of pipes, drain lines or ductwork shall be determined by making measurements at all traps and other appropriate access points to the interior of the pipes, drain lines or ductwork.

(f) Surfaces of premises, equipment or scrap that may be contaminated and that are of such size, construction or location as to make the surface inaccessible for purposes of measurement, shall be presumed to be contaminated in excess of the levels.

(g) The amount of removable radioactive material per 100 square centimeters (cm2) of surface area shall be determined by wiping that area, with dry filter or soft absorbent paper and with the application of moderate pressure, and assessing the amount of radioactive material on the wipe with an appropriate instrument of known efficiency.

(h) For objects of lesser than 100 cm2 surface area, the entire surface shall be wiped and the above levels reduced in direct proportion to the area of the object.

(i) Measurements of fixed contaminant shall not be averaged over more than 1.0 square meter.

(j) For objects of lesser than 1.0 square meter area the average shall be derived from measurements made on each of the surfaces of the object.

(k) Disintegrations per minute (dpm) shall be determined by correcting the counts per minute observed by an appropriate detector and count rate meter, for background, efficiency, and geometric factors associated with the instrumentation.

(l) Fixed beta-gamma contamination levels shall be measured through not more than 7 milligrams per square centimeter of total absorber.

He-P 4021.21 Permissible Levels of Surface Contamination. Levels of surface contamination shall be in compliance with the restrictions set forth in the Rules cited in Table 4021.1 below.

Table 4021.1 Permissible Levels of Surface Contamination

NUCLIDE	FIXED		REMOVABLE
	Average	Maximum	
U-nat, U-235, U-238 and associated decay products	5,000 dpm α /100 cm^2	15,000 dpm α /100 cm^2	1,000 dpm α /100 cm^2
Transuranics, Ra-226, Ra. 228,Th-230,Th-228	100 dpm α /100 cm^2	200 dpm α /100 cm^2	20 dpm α /100 cm^2

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	Pa-231, Ac-227,1-125, 1-129 NUCLIDE — FIXED (Average / Maximum) — REMOVABLE Th-nat, Th-232, Sr-90, Ra-223, 1-126,1-131, 1-133: 1,000 dpm α /100 cm² / 3,000 dpm α /100 cm² / 200 dpm α /100 cm² Beta-gamma emitters (nuclides with decay modes other than alpha emission or spontaneous except Sr-90 and others noted above.: 5,000 dpm βλ/100 cm2 / 15,000 dpm β λ/100 cm² / 1,000 cpm βλ/μ100 cm² Definitions: **Byproduct material** as defined in RSA 125-F:3; (see below) and (2) The tailings or wastes produced by the extraction or concentration of uranium or thorium from ore processed primarily for its source material content, including discrete surface wastes resulting from uranium or thorium solution extraction processes except underground ore bodies depleted by these solution extraction operations. **Byproduct material** means 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. **Disposal** means that portion of a land disposal facility which is used for disposal of waste, consisting of disposal units and a buffer zone. Note: Disposal as defined above is specific to Part He-P 4060 entitled "Licensing Requirements for Disposal of Low-Level Radioactive Waste" Disposal is not specifically defined as it applies to removal of radioactive material by transfer, decay in storage, effluent release or as authorized by He-P 4023 entitled "Waste Disposal". **Waste** means those low-level radioactive wastes as defined in RSA 125-F:3 X. RSA 125-F:3 X "Low-level radioactive waste" means radioactive waste not classified as high-level radioactive waste, transuranic waste, spent nuclear fuel, or byproduct material as defined in paragraph II.
NORTH DAKOTA Release Criteria:	Concentration in soil and other materials except water: (1) Radioactive material except source material and radium; Schedule A, column II of chapter 33-10-03. (2) Source material and radium in soil: Concentration of radionuclides above background concentrations for total radium, averaged over areas of 100 square meters, shall not exceed: (i) 5 picocuries per gram of dry soil, averaged over the first 15 centimeters below the surface; and (ii) 5 picocuries per gram or dry soil, averaged over layers of 15 centimeters thickness more than 15 centimeters below the surface. (3) Source material and radium in other materials: Concentration of radionuclides above background concentrations for total radium shall not exceed 5 picocuries per gram. The level of gamma radiation measured at a distance of 100 centimeters from the surface shall not exceed background. Definitions: **Waste** means those low-level radioactive wastes that are acceptable for disposal in a land disposal facility. For the purposes of this definition, low-level waste has the same meaning as in the Low-Level Radioactive Waste Policy Act [Pub. L. 96-573; 94 Stat. 3347; 42 U.S.C. 2021b-2021j], as amended by Pub. L. 99-240 Stat. 3347; 42 U.S.C. 2021b-2021j], effective January 15, 1986; that is radioactive waste: (a) Not classified as high-level radioactive waste, spend nuclear fuel, or byproduct material as defined in section 11e.(2) of he Atomic Energy act [Pub. L. 95-604; 92 Stat. 3033; 42 U.S.C. 2014(e)(2)] (uranium or thorium tailings and waste); and (b) Classified as low-level radioactive waste consistent with existing law and in accordance with subdivision a by the United States Nuclear Regulatory Commission. **Byproduct material** means: (a) Any radioactive material, except special nuclear material, yielded in or

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	made radioactive by exposure to the radiation incident to the process of producing or utilizing special nuclear material; and (b) the tailings or wastes produced by the extraction or concentration of uranium or thorium from ore processed primarily for its source material content, including discrete surface wastes resulting form uranium or thorium solution extraction processes. Underground ore bodies depleted by these solution extraction operations do not constitute "byproduct material" within this definition.
OREGON Release Criteria:	Oregon uses Reg Guide 1.86 to determine the unrestricted release limits of solid materials.
Definitions:	**By-product material** means: (a) 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; and (b) The tailings or wastes produced by 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. Underground ore bodies depleted by these solution extraction operations shall not constitute by-product material within this definition.
NEBRASKA Release Criteria:	The Nebraska response to question 43 dealing with Nebraska radiological criteria for unrestricted release of solid materials is found within Title 190 NAC 1-004. Since your question deals specifically with solid materials Section 4.37D and following is the applicable area. Unlike almost all of the rest of Title 180 NAC which follows 10CFR rather closely, this area is modeled on Texas law dealing with disposal of radioactive materials in a city or county landfill. I have included a copy of our sections dealing with this matter. Particular points of note are: (a) It is intended for disposal use in those city or county landfills authorized to receive radioactive material; (b) Surveys must be performed to verify the actual limits are not exceeded; (c) there are limits for both the volumetric concentration (no specific surficial limit beyond those normally applicable which would quality the material as surface contaminated object low-level radioactive waste) and the total disposal quantity for a given generator; (d) Prior to disposal, procedures must be submitted to Nebraska HHS Regulation and Licensure that cover the delivery, physical emplacement and the covering of the material, compliance surveys, maintaining secure packaging during transport, record maintenance, landfill operator's agreement to such a disposal, etc; (e) This section is intended for waste disposal, not recycling; (f) In any case Tc-99 is not one of isotopes spelled out in Appendix 4-G. The isotopes specified are generally under one year in half life and Tc-99 has a half-life of 213,000 years.
Definitions:	**Waste** means those low-level radioactive wastes that are acceptable for disposal in a management facility. For the purpose of this definition, low-level waste has the same meaning as in the Low-Level Radioactive Waste Policy Act, P.L. 96-573, as amended by P.L. 99-240, effective January 15, 1986; that is, radioactive waste (a) not classified as high-level radioactive waste, transuranic waste, spent nuclear fuel, or byproduct material as defined in Section 11e.(2) of the Atomic Energy Act (uranium or thorium tailings and waste) and (b) classified as low-level radioactive waste consistent with existing law and in accordance with (a) by the U.S. Nuclear Regulatory Commission. **Disposal** means the permanent isolation of radioactive wastes from the biosphere inhabited by man and his food chain by emplacement in a management facility. **Byproduct material** means: (1) 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; and (2) the tailings or wastes produced by the extraction or concentration of uranium or thorium from ore processed primarily for its source material content, including discrete surface wastes resulting from uranium or thorium solution extraction processes. Underground ore bodies depleted by solution extraction operations do not constitute byproduct material. The remaining requested definitions (effluent, transfer and release limits) are not specifically denoted in our radiological health regulations.
NEW YORK Release Criteria:	<u>New York State Department of Health</u> There are a few mechanisms that allow the unrestricted release of solid materials. These are: Patients that are administered radioactive materials for diagnostic or therapeutic purposes. The criteria for release is based on an estimation or calculation by the licensee that another individual is not likely to

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	receive more than 500mrem from the patient. If it is likely that another individual could receive more than 100mrem then the licensee must provide written information to the patient on the risks of radiation and methods to reduce exposure to others. Radioactive materials with half-lives of 90 days or less, held for decay-in-storage (DIS). The criteria are that these materials be held for 10 half-lives and prior to disposal, surveyed to determine that its radioactivity cannot be distinguished from background. Note: This is not exactly "unrestricted" release since the materials should be disposed as "normal waste." However this doesn't prohibit recycling. Any equipment or facility that has a surface that has a surface contamination of less than the specified value in Table 7 of Appendix 16-A of Part 16. The criterion is listed in Table 7. Other scenarios are evaluated on a case by case basis. The department utilizes available programs such as RESRAD to estimate potential doses to critical members of the public from such a release. Normally for situations involving the decommissioning of contaminated lands, the department will work with the NYSDEC to make a determination on acceptable release concentrations and restrictions, if necessary. For these evaluations, the 10mrem/yr guidance developed by DEC is used. For any requests for the recycling of contaminated materials, the department would use other guidance such as those developed by ICRP, NCRP and IAEA (e.g., 1mrem/yr dose to a member of the public) prior to making any determination on release.
Definitions:	**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; and (ii) The tailings or wastes produced by the extraction or concentration of uranium or thorium from ore processed primarily for its source material content, including discrete surface waste resulting from uranium or thorium solution extraction processes. Underground or bodies depleted by these solutions extraction operations do not constitute "byproduct material" within this definition.
Release Criteria:	<u>New York City Department of Health</u> Our regs don't have any radiological criteria for the unrestricted release of solid materials. We would defer to DEC in this area.
Definitions:	**Waste** means those low-level radioactive wastes that are acceptable for disposal in a land disposal facility. For the purposes of this definition, low-level waste has the same meaning as in the Low-Level-Radioactive Waste Policy Act, 96-573, as amended by P.L. 99-240, effective January 15, 1986; that is radioactive waste (a) not classified as high-level radioactive waste, spent nuclear fuel, or byproduct material as defined in Section 11e.(2) of the Atomic Energy Act (uranium or thorium tailing and waste) and (b) classified as low-level radioactive waste consistent with existing law and in accordance with the U.S. Nuclear Regulatory Commission. **Byproduct material** means: (i) 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; and (ii) The tailings or wastes produced by the extraction or concentration of uranium or thorium from ore processed primarily for its source material content, including discrete surface waste resulting from uranium or thorium solution extraction processes. Underground or bodies depleted by these solution extraction operations do not constitute "byproduct material" within this definition.
Release Criteria:	<u>New York Department of Labor</u> The release of solid materials from facilities licensed by the New York State Department of Labor is done on a case-by-case basis in accordance with Industrial code Rule 38, Section 38.23 (b). This requires that before any property suspected of being contaminated is released, it must be decontaminated to the limits specified in Table 5 of Section 38.41. It further requires that a radiological survey of the property be submitted and accepted as demonstrating that any residual contamination is as low as reasonably achievable before the property can be released. (b) Property. No machinery, instruments, laboratory equipment or any other property used in contact with or in close proximity to radioactive material in a licensed installation shall be assigned, sold, leased or transferred to an unlicensed person unless such property has been permanently decontaminated below or equal to the limits specified in Table 5 of Section 38.41 of this Part (rule). A survey shall be made after such decontamination and submitted to the commissioner. No such property shall be assigned, sold, leased or transferred until such survey has been accepted by the commissioner.

Agreement State	Release Criteria and Definitions
Release Criteria: Definitions:	<u>New York Department of Environmental Control</u> The only solid material that DEC releases for unrestricted use is soil on sites that are remediated to remove radioactive contaminants. The criterion is set by a guidance document, Cleanup Guideline for Soils Contaminated with Radioactive Materials, Division of Solid & Hazardous Materials Technical Administrative Guidance memorandum 4003 ("TAGM 4003"). It is accurately summarized in the 1993 chart NRC distributed with SP-99-074, i.e., "<10 mrem/yr and ALARA excluding background." 6 NYCRR 381.4 (q) "Low-level radioactive waste" or "LLRW" or **Waste** means radioactive material that is not high-level radioactive waste, transuranic waste, spent nuclear fuel or the tailings or wastes produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material content, and the U.S. Nuclear Regulatory Commission consistent with Federal law classifies as low-level radioactive waste. 6 NYCRR 382.2 (34) "Low-level radioactive waste" or **Waste** means those low-level radioactive wastes that are acceptable for disposal in a land disposal facility pursuant to the provisions of this Part. For the purpose of this Part, low-level radioactive waste has the same meaning as in the Federal Low-Level Radioactive Waste Policy Amendments Act of 1985, 42 U.S.C. Section 2021b. et seq. (see Section 382.99 of this Part) that is, radioactive material that: (i) is not classified as high-level radioactive waste, spent nuclear fuel, or byproduct material as defined in Section 11e(2) of the Atomic Energy Act; and (ii) is classified as low-level radioactive waste consistent with Federal law and in accordance with paragraph (1) above by the U.S. Nuclear Regulatory Commission. 6 NYCRR 381.4 (k) **Disposal** means the discharge or deposit of low-level radioactive waste at an authorized treatment, storage or disposal facility for the purpose of isolating this low-level radioactive waste from the biosphere inhabited by man. 6 NYCRR 382.2 (16) **Disposal** means the isolation of radioactive waste from the biosphere inhabited by humans and containing their food chains by emplacement in land disposal facilities. **Effluent** is defined in DEC's radioactive materials regulations. 6 NYCRR 383-2(7) **Byproduct material** means 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.
NORTH CAROLINA Release Criteria: Definitions:	For guidance, the NRC criteria as stated in Reg Guide 1.86 is used to determine when solid material may be released for unrestricted use. Our goal is to release only those materials and facilities that have no activity that is distinguishable above background. When laboratory data is available the NRCP test between the differences in two means is used, i.e., background mean vs sample mean. For other monitoring instruments, our standard has been material can be released if the activity is not distinguishable above background. In particular, this is that the readings are not above twice background. This guidance is applied on a case-by-case basis with professional health physics judgement that the amount of radioactivity involved in sufficiently low as to not be of any public health and safety or environmental concern. No specific criteria exist to differentiate between surficial and volumetric contamination. **By-product material** means 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. **Low-level radioactive waste** means low-level radioactive waste as defined in the Low-Level Radioactive Waste Policy Amendments Act of 1985, Pub. L. 99-240, 99 Stat. 1842, 42 U.S.C. 2021b et seq. And other waste, including waste containing naturally occurring and accelerator produced radioactive material, which is not regulated by the United States Nuclear Regulatory Commission or other agency of the Federal government and which is determined to be low-level radioactive waste by the North Carolina Radiation Protection Commission. **Disposal** means the isolation of waste from the biosphere inhabited by man and his food chains by emplacement in a land disposal facility.

Agreement State	Release Criteria and Definitions
	Waste means low-level radioactive waste that is acceptable for disposal in a land disposal facility. For the purpose of this Section, the words waste and "low-level radioactive waste" have the same meaning.
OHIO Release Criteria:	Ohio has adopted the same release limits that were adopted by NRC in Subpart E of 10 CFR 20. Anything contaminated with radioactive material that is removed from a site is low-level radioactive waste. Following Section 3748.10 of the Ohio Revised Code, such material must be disposed at a facility that is licensed to receive and dispose low-level radioactive waste. Decontamination of objects is done using NRC guidelines. The objects are inspected and released in accordance with NRC guidelines. Ohio's criteria regarding surficial and volumetric contamination differentiate to the same extent that NRC Regulatory Guide 1.86 differentiates between these types of contamination. Ohio standards authorized the disposal of certain products and materials as specified in OAC 3701-39-02, (B)(2) that is enclosed. Ohio also uses NRC Regulatory Guide 1.86 in decision-making regarding disposition of certain resources contaminated with radioactive materials. Section 3748.10 of the Ohio Revised Code provides that low-level radioactive waste can only be treated, stored, re-cycled, or disposed at a facility licensed by the department.
Definitions:	Ohio has adopted through incorporation by reference standards for byproduct material, source material, and special nuclear material in 10CFR 19, 20, 21, 30-36, 39, 40, 61, 70, 71 and sections 150.3 (b), 150.3 (f), 150.10, 150.11, 150.15 (a), 150.32 including definitions for "waste," "disposal," and "byproduct materials." Ohio has not adopted a rule defining "transfer," "release limits," or "effluent."
RHODE ISLAND Release Criteria	NRC criteria contained in the 1987 NRC Guidelines for Contamination of Facilities and Equipment have been used for ordinary license terminations. No specialized release criteria such as for soils or other bulk materials have been used.
Definitions:	**Byproduct material** means: (1) 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; and (2) the tailings or wastes produced by the extraction or concentration of uranium or thorium from ore processed primarily for its source material content, including discrete surface wastes resulting from uranium or thorium solution extraction processes. Underground ore bodies depleted by solution extraction operations do not constitute byproduct material within this definition.
SOUTH CAROLINA Release Criteria:	South Carolina has not approved any materials for unrestricted use. We have approved alternate methods of disposal of disposal under the state equivalent to 10 CFR 20.2002. These have been approved on a case-by-case basis using a dose criteria of 1 millirem per year to the maximally exposed individual. Some very low activity materials have been approved for disposal in industrial landfills and RCRA disposal cells. South Carolina has performed evaluations on a case-by-case basis to develop criteria for alternate methods of disposal and for decommissioning. They have been developed using the RESRAD family of code. For alternate methods of disposal, the maximum annual dose which has been used is 15 millirem, which is consistent with the 25 millirem decommissioning standard and applies to ALARA.
Definitions	**Waste:** Those low-level radioactive wastes that are acceptable for disposal in a lang disposal facility. For the purposes of this definition, low-level waste has the same meaning as in the Low-Level Radioactive Waste Policy Amendments Act of 1985, P.L. 99-240, radioactive waste not classified as high-level radioactive waste, transuranic waste, spent nuclear fuel, or byproduct material as defined in Section 11e.(2) of the Atomic Energy Act (uranium or thorium tailings and waste). **Disposal:** The isolation of waste from the biosphere inhabited by man and his food chains by emplacement in a land disposal facility. **Byproduct material:** (1) any radioactive material (except special nuclear material) yielded in or made radioactive by exposure to radiation incident to the process of producing or utilizing special nuclear material, and (2) the tailings or waste produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material content.

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TENNESSEE	
Release Criteria	U.S.N.R.C. Regulatory Guide 1.86 and Policy and Guidance PG-8-08 are used for the release of dirt, resins, asphalt, concrete, metals, and other wastes from licensed activities.
Definitions	Byproduct Material refers to 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. Disposal - Means the isolation of radioactive wastes from the biosphere inhabited by man and containing his food chains by emplacement in a land disposal facility. Waste - Means those low-level radioactive wastes containing radioactive materials that are acceptable for disposal at a land disposal facility. For the purposes of this definition, low-level waste is radioactive waste not classified as high-level radioactive waste, transuranic waste, spent nuclear fuel or byproduct material as defined in section 11e.(2) of the Atomic Energy Act (uranium or thorium tailings and waste).
TEXAS	**<u>Texas Natural Resource Conservation Commission</u>**
Release Criteria:	**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). 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. 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.

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(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

Radionuclide 1	Average[2,3,6]	Maximum[2,4,6]	Removable[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 cm^2	15,000 dpm alpha/ 100 cm^2	1,000 dpm alpha/ 100 cm^2
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 cm^2	3,000 dpm/100 cm^2	200 dpm/100 cm^2
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 cm^2	15,000 dpm beta gamma/100 cm^2	1,000 dpm beta gamma/100 cm^2

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,

Agreement State	Release Criteria and Definitions
Definitions:	measured through not more than 7 milligrams/cm2 of total absorber. **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) **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** - 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 groundwater disposal (Note: currently the only applicable definition for NORM waste) **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 limitation** - Any restriction imposed on quantities, discharge rates, and concentrations of pollutants which are discharged from point sources into waters in the state. (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

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	characteristics. Underground ore bodies depleted by these solution extraction processes do not constitute "byproduct material" within this definition.
:	**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.
Release Criteria:	**Texas Department of Health** Release Standards in §289.202 (ccc) Vacating premises. (1) Each licensee, registrant, or person possessing non-exempt sources of radiation shall, no less than 30 days before vacating or relinquishing possession or control of premises, notify the agency, in writing, of the intent to vacate. (2) The licensee or person possessing non-exempt radioactive material shall decommission the premises to a degree consistent with subsequent use as an unrestricted area and in accordance with the requirements of subsections (ddd) and (eee) of this section. (3) Notwithstanding the limits set forth in subsections (ddd) and (eee) of this section, contamination levels must be maintained in unrestricted areas so that no individual member of the public will receive an effective dose equivalent in excess of 100 mrem (1 mSv) above background per year. (4) No licensee shall vacate a facility or land, or release a facility or land for unrestricted use, until the annual total effective dose equivalent to a member of the public resulting from radioactive material remaining from licensed activities (excluding radium and its decay products) does not exceed 25 mrem (0.25 mSv) per year above background. The concentration for radium in soil shall be equivalent to or below the limits in subsection (eee) of this section. Notwithstanding the limits in this paragraph, each licensee shall make every reasonable effort to maintain any contamination of soil or vegetation ALARA. The licensee shall conduct all necessary radiation surveys and modeling and shall provide reports and documentation to demonstrate that the requirements for release for unrestricted use have been met. The Agency may require the licensee to provide any other information necessary to demonstrate that the facilities and land are suitable for release for unrestricted use. (ddd) Soil contamination limits. (1) No licensee shall possess, receive, use, or transfer radioactive material in such a manner as to cause contamination of soil in unrestricted areas, to the extent that the contamination exceeds, on a dry weight basis, the concentration limits specified in: (A) subsection (ggg)(8) of this section; or (B) the effluent concentrations in Table III of subsection (ggg)(2) of this section, with the units changed from microcuries per milliliter to microcuries per gram, for radionuclides not specified in subsection (ggg)(8) of this section or paragraph (3) of this subsection. (2) Where combinations of radionuclides are involved, the sum of the ratios between the concentrations present and the limits specified in paragraph (1) of this subsection shall not exceed one. (3) Except for the requirements in §289.127 of this title and notwithstanding the limits imposed by paragraph (1) of this subsection, the concentration of radium-226 or radium-228 in soil averaged over any 100 square meters (m^2) shall not exceed the background level by more than: (A) 5 picocuries per gram (pCi/g) (0.185 becquerel per gram (Bq/g)), averaged over the first 15 cm of soil below the surface; and

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	(B) 15 pCi/g (0.555 Bq/g), averaged over 15 cm thick layers of soil more than 15 cm below the surface. (4) 5 pCi/g (0.185 Bq/g), based on dry weight, for radium-226 or radium-228 in vegetation; and (5) the following limits, based on dry weight, averaged over any 100 m^2 of area for natural uranium with no daughters present: (A) 30 pCi/g (1.11 Bq/g), averaged over the top 15 cm of soil below the surface; and (B) 150 pCi/g (5.55 Bq/g), average concentration at depths greater than 15 centimeters below the surface so that no individual member of the public will receive an effective dose equivalent in excess of 100 mrem (1 mSv) per year. (eee) Surface contamination limits for facilities and equipment. (1) Prior to vacating any facility or releasing areas or equipment for unrestricted use, each licensee shall ensure that radioactive contamination has been removed to ALARA levels. In no case shall the licensee vacate a facility or release areas or equipment for unrestricted use until radioactive surface contamination levels are below the limits specified in subsection (ggg)(6) of this section. (2) In addition to meeting the surface contamination limits of paragraph (1) of this subsection, porous materials (e.g., concrete), that 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 pCi/g, shall be made. The material may be released for unrestricted use if the radionucl de concentrations do not exceed the limits specified for soil in subsection (ddd) of this section. (fff) Exemption of specific wastes. (1) A licensee may discard the following licensed material without regard to its radioactivity: (A) 0.05 microcurie (µCi) (1.85 kilobecquerels (kBq)), or less, of hydrogen-3, carbon-14, or iodine-125 per gram of medium used for liquid scintillation counting or in vitro clinical or in vitro laboratory testing; and (B) 0.05 µCi (1.85 kBq), or less, of hydrogen-3, carbon-14, or iodine-125, per gram of animal tissue, averaged over the weight of the entire animal. (2) A licensee shall not discard tissue in accordance with paragraph (1)(B) of this subsection in a manner that would permit its use either as food for humans or as animal feed. (3) The licensee shall maintain records in accordance with subsection (tt) of this section. (4) Any licensee may, upon agency approval of procedures required in paragraph (6) of this subsection, discard licensed material included in subsection (ggg)(7) of this section, provided that it does not exceed the concentration and total curie limits contained therein, in a Type I municipal solid waste site as defined in the Municipal Solid Waste Regulations of the authorized regulatory agency (31 TAC Chapter 330), unless such licensed material also contains hazardous waste, as defined in Section 3(15) of the Solid Waste Disposal Act, Health and Safety Code, Chapter 361. Any licensed material included in subsection (ggg)(7) of this section and which is a hazardous waste as defined in the Solid Waste Disposal Act may be discarded at a facility authorized to manage hazardous waste by the authorized regulatory agency. (5) Each licensee who discards material described in paragraphs (1) or (4) of this subsection shall: (A) make surveys adequate to assure that the limits of paragraphs (1) or (4) of this subsection are not exceeded; and

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(B) remove or otherwise obliterate or obscure all labels, tags, or other markings that would indicate that the material or its contents is radioactive.

(6) Prior to authorizations in accordance with paragraph (4) of this subsection, a licensee shall submit procedures to the agency for:

(A) the physical delivery of the material to the disposal site;

(B) surveys to be performed for compliance with paragraph (5)(A) of this subsection;

(C) maintaining secure packaging during transportation to the site; and

(D) maintaining records of any discards made under paragraph (4) of this subsection.

(7) Nothing in this section relieves the licensee of maintaining records showing the receipt, transfer, and discard of such radioactive material as specified in §289.201(d) of this title.

(8) Nothing in this section relieves the licensee from complying with other applicable federal, state, and local regulations governing any other toxic or hazardous property of these materials.

(ggg) Appendices

(6) Acceptable surface contamination levels.

NUCLIDE[a]	AVERAGE[bcf]	MAXIMUM[bdf]	REMOVABLE[bcef]
U-nat, U-235, U-238, and associated decay products except Ra-226, Th-230, Ac-227, and Pa-231	5,000 dpm alpha/ 100 cm^2	15,000 dpm alpha/ 100 cm^2	1,000 dpm alpha/ 100 cm^2
Transuranics, Ra-223, Ra-224, Ra-226, Ra-228, Th-nat, Th-228, Th-230, Th-232, U-232, Pa-231, Ac-227, Sr-90, I-129	1,000 dpm/100 cm^2	3,000 dpm/100 cm^2	200 dpm/100 cm^2
Beta-gamma emitters (nuclides with decay modes other than alpha emission or spontaneous fission) except Sr-90 and others noted above.	5,000 dpm beta, gamma/100 cm^2	15,000 dpm beta, gamma/100 cm^2	1,000 dpm beta, gamma/100 cm^2

a Where surface contamination by both alpha and beta-gamma emitting nuclides exists, the limits established for alpha and beta-gamma emitting nuclides should apply independently.

b As used in this table, 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.

c Measurements of average contamination level should not be averaged over more than 1 square meter. For objects of less surface area, the average should be derived for each object.

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d The maximum contamination level applies to an area of not more than 100 cm^2.

e The amount of removable radioactive material per 100 cm^2 of surface area should 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 should be reduced proportionally and the entire surface should be wiped.

f The average and maximum radiation levels associated with surface contamination resulting from beta-gamma emitters should not exceed 0.2 mrad/hr at 1 centimeter and 1.0 mrad/hr at 1 centimeter, respectively, measured through not more than 7 mg/cm^2 of total absorber.

(7) Concentration and activity limits of nuclides for disposal in a Type I municipal solid waste site or a hazardous waste facility (for use in subsection (fff) of this section).

Nuclides	Concentrations Limit (Ci/m^3)	Annual Generator Disposal Limit (Ci/yr)
F-18	3×10^{-1}	8
Si-31	$1 \times 10^{+2}$	$3 \times 10^{+3}$
Na-24	9×10^{-4}	2×10^{-2}
P-32	2	$5 \times 10^{+1}$
P-33	10	$3 \times 10^{+2}$
S-35	9	$2 \times 10^{+2}$
Ar-41	3×10^{-1}	8
K-42	2×10^{-2}	5×10^{-1}
Ca-45	4	$1 \times 10^{+2}$
Ca-47	2×10^{-2}	5×10^{-1}
Sc-46	2×10^{-3}	5×10^{-2}
Cr-51	6×10^{-1}	$2 \times 10^{+1}$
Fe-59	5×10^{-3}	1×10^{-1}
Co-57	6×10^{-2}	2
Co-58	1×10^{-2}	3×10^{-1}
Zn-65	7×10^{-3}	2×10^{-1}
Ga-67	3×10^{-1}	8
Se-75	5×10^{-2}	1
Br-82	2×10^{-3}	5×10^{-2}
Rb-86	4×10^{-2}	1
Sr-85	2×10^{-2}	5×10^{-1}
Sr-89	8	$2 \times 10^{+2}$
Y-90	4	$1 \times 10^{+2}$
Y-91	4×10^{-1}	10
Zr-95	8×10^{-3}	2×10^{-1}
Nb-95	8×10^{-3}	2×10^{-1}
Mo-99	5×10^{-2}	1
Tc-99m	1	$3 \times 10^{+1}$
Rh-106	1	$3 \times 10^{+1}$
Ag-110m	2×10^{-3}	5×10^{-2}
Cd-115m	2×10^{-1}	5
In-111	9×10^{-2}	2
In-113m	9	$2 \times 10^{+2}$
Sn-113	6×10^{-2}	2
Sn-119	$2 \times 10^{+1}$	$5 \times 10^{+2}$
Sb-124	2×10^{-3}	5×10^{-2}
Te-129	2×10^{-1}	5
I-123	4×10^{-1}	$1 \times 10^{+1}$
I-125	7×10^{-1}	$2 \times 10^{+1}$
I-131	4×10^{-2}	1
I-133	2×10^{-2}	5×10^{-1}
Xe-127	8×10^{-2}	2
Xe-133	1	$3 \times 10^{+1}$

Ba-140	2×10^{-3}	5×10^{-2}
La-140	2×10^{-3}	5×10^{-2}
Ce-141	4×10^{-1}	$1 \times 10^{+1}$
Ce-144	1×10^{-3}	3×10^{-2}
Pr-143	6	$2 \times 10^{+2}$
Nd-147	7×10^{-2}	2
Yb-169	6×10^{-2}	2
Ir-192	1×10^{-2}	3×10^{-1}
Au-198	3×10^{-2}	8×10^{-1}
Hg-197	8×10^{-1}	$2 \times 10^{+1}$
Tl-201	4×10^{-1}	$1 \times 10^{+1}$
Hg-203	1×10^{-1}	3

NOTE: In any case where there is a mixture in waste of more than one radionuclide, the limiting values for purposes of this paragraph shall be determined as follows:

For each radionuclide in the mixture, calculate the ratio between the quantity present in the mixture and the limit established in this paragraph for the specific radionuclide when not in a mixture. The sum of such ratios for all the radionuclides in the mixture may not exceed "1" (i.e., "unity").

Examples: If radionuclides a, b, and c are present in concentrations C_a, C_b, and C_c, and if the applicable concentrations are CL_a, CL_b, and CI_c respectively, then the concentrations shall be limited so that the following relationship exists:

$$(C_a/CL_a) + (C_b/CL_b) + (C_c/CL_c) < 1$$

If the total curies for radionuclides a, b, and c are represented A_a, A_b, and A_c, and the annual curie limit for each radionuclide is AL_a, AL_b, and AL_c, then the generator is limited to the following:

$$(A_a/AL_a) + (A_b/AL_b) + (A_c/AL_c) < 1$$

(8) Soil contamination limits for selected radionuclides (for use in subsection (ddd) of this section).

[s] 1

Isotope	Concentration (pCi/g)
Americium-241	6
Antimony-125	100
Bismuth-207	60
Cadmium-109	200
Carbon-14	800
Cesium-137	40
Cobalt-60	300
Europium-152	80
Europium-154	20
Europium-155	200
Hydrogen-3	3,000
Iodine-125	200
Iodine-129	200
Iodine-131	60
Iridium-192	40
Iron-55	2,000
Nickel-63	700
Plutonium-238	6
Plutonium-239	6
Plutonium-240	6
Promethium-147	200
Scandium-46	40

*Agreement State	Release Criteria and Definitions
	Sodium-22 30 Strontium-90 40 Technetium-99 200 Thallium-204 60 Thorium-230 6 Thorium-232 8 Uranium-234 6 Uranium-238 8 Uranium-natural 30 Release Standards in §289.251 ****(c) Exemptions for source material. (1) Any person is exempt from this section and §289.252 of this title if that person receives, possesses, uses, or transfers source material in any chemical mixture, compound, solution, or alloy in which the source material is by weight less than 1/20 of 1% (0.05%) of the mixture, compound, solution, or alloy. ****This exemptions allows disposal of FUSRAP materials in a hazardous or solid waste disposal facility. **Byproduct material** - Byproduct material is defined as: (A) 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; and (B) the tailings or wastes produced by or resulting from the extraction or concentration or uranium or thorium from any ore processed primarily for its source material content, including discrete surface wastes resulting form uranium solution extraction processes." (25 Texas Administrative Code (TAC) §289.201(b)(15)) **Disposal** - Isolation or removal of radioactive wastes from mankind and his environment. The term does not include emissions and discharges under rules of the agency." (25 TAC §289.254(b)(3)) **Radioactive waste** - Any discarded or unwanted radioactive material, unless exempted by agency rule or any radioactive material that would require processing before it could be put to a beneficial reuse. The term does not include byproduct material as defined in paragraph (15)(B) of this subsection, or uranium ore, naturally occurring radioactive material (NORM) waste, or oil and gas NORM waste." (25 TAC §289.201(b)(82))
Definitions	****"Low-level radioactive waste (LLRW) - Radioactive material that meets the following criteria: (A) LLRW is radioactive material that is: (i) discarded or unwanted and is not exempt by rule adopted under the Texas Radiation Control Act (Act), Health and Safety Code, §401.106; (ii) waste, as that term is defined in 10 CFR Part 61.2; and (iii) subject to: (I) concentration limits established in 10 CFR Part 61.55, or compatible rules adopted by the agency or the Texas Natural Resource Conservation Commission (TNRCC), as applicable; and (II) disposal criteria established in 10 CFR, or established by the agency or TNRCC, as applicable. (B) LLRW does not include:

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	(i) high-level radioactive waste as defined by 10 CFR 60.2; (ii) spent nuclear fuel as defined by 10 CFR 72.3; (iii) byproduct material defined in the Act, Health and Safety Code, §401.003(3)(B); (iv) naturally occurring radioactive material (NORM) waste that is not oil and gas NORM waste; or (v) oil and gas NORM waste. **Proposed for deletion; Proposed 11/99, Adopted 2/00 ***Proposed new definition; Proposed 11/99, Adopted 2/00
UTAH Release Criteria: Definitions:	Utah makes use of guidance and license authorizations for radiological criteria pertaining to the unrestricted release of solid materials. For objects with superficial contamination, we have used the values contained in NRC Regulatory Guide 1.86. Our experience with volumetric contamination in materials, other than soils, is limited to flue dust from an electric arc furnace and splash condenser dross residue from a high temperature sinter process. In both cases, the contaminant was cesium-137. The unrestricted release level we approved, before the NRC Technical Position on Incident Related Material, was 5.0 picocuries per gram. **Waste** means those low-level radioactive wastes that are acceptable for disposal in a land disposal facility. For the purposes of this definition, low-level waste has the same meaning as in the Low-Level Radioactive Waste Policy Act, P.L. 96-573, as amended by P.L. 99-240, effective January 15, 1986; that is, radioactive waste: (a) not classified as high-level radioactive waste, spent nuclear fuel, or byproduct material as defined in Section 11e.(2) of the Atomic Energy Act (uranium or thorium tailings and waste) and (b) classified by the U.S. Nuclear Regulatory Commission as low-level radioactive waste consistent with existing law and in accordance with (a) above. **Disposal** means the isolation of wastes from the biosphere by placing them in a land disposal facility. **Byproduct material** means: (a) a radioactive material, with the exception of special nuclear material, yielded in or made radioactive by exposure to the radiation incident to the process of producing or utilizing special nuclear material; and (b) the tailings or wastes produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material content, including discrete surface wastes resulting from uranium or thorium solution extraction processes. Underground ore bodies depleted by these solution extraction operations do not constitute "byproduct material" within this definition.
WASHINGTON Release Criteria:	The following regulations (found at http://slc.leg.wa.gov/) pertain to the unrestricted release of "solid materials:" WAC 246-221-270 Vacating Premises and Release of Equipment; WAC 246-232-060 Termination of Licenses; WAC 246-232-140 Schedule D (Acceptable Surface Contamination Levels); Schedule D. ACCEPTABLE SURFACE CONTAMINATION LEVELS NUCLIDES A AVERAGE B C F MAXIMUM B D F REMOVABLE B E F WIPE LIMITS U-nat, U-235, 5,000 dpm 15,000 dpm 1,000 dpm

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	U-238, and associated decay products: &agr;/100 cm2 / &agr;/100 cm2 / &agr;/100 cm2 Transuranics, Ra-226, Ra-228, Th-230, Th-228, Pa-231, Ac-227, I-125, I-129: 100 dpm/100 cm2 / 300 dpm/100 cm2 / 20 dpm/100 cm2 Th-nat, Th-232, Sr-90, Ra-223, Ra-224, U-232, I-126, I-131, I-133: 1000 dpm/100 cm2 / 3000 dpm/100 cm2 / 200 dpm/100 cm2 Beta-gamma emitters (nuclides with decay modes other than alpha emission or spontaneous fission) except SR-90 and others noted above: 5000 dpm &bgr;&ggr;/100 cm2 / 15,000 dpm &bgr;&ggr;/100 cm2 / 1000 dpm &bgr;&ggr;/100 cm2 AWhere surface contamination by both alpha- and beta-gamma-emitting nuclides exists, the limits established for alpha- and beta-gamma-emitting nuclides should apply independently. BAs used in this table, 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. CMeasurements of average contaminant should not be averaged over more than 1 square meter. For objects of less surface area, the average should be derived for each such object. DThe maximum contamination level applies to an area of not more than 100 cm2. EThe amount of removable radioactive material per 100 cm2 of surface area should 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 should be reduced proportionally and the entire surface should be wiped. FThe average and maximum radiation levels associated with surface contamination resulting from beta-gamma emitters should not exceed 0.2 mrad/hr at 1 cm and 1.0 mrad/hr at 1 cm, respectively, measured through not more than 7 milligrams per square centimeter of total absorber. WAC 246-221-220 Disposal of Specific Wastes (animal carcasses!); WAC 246-239-055 Release of Individuals Containing Radiopharmaceuticals; (representing a direct exposure and a contamination hazard); WAC 246-240-025 Release of Individuals Containing Permanent Implants (e.g., representing an indirect exposure hazard from "passed" seeds). As for guidance, we use NRC NUREGs and other NRC documents (such as NRC's Policy and Guidance Directive FC 83-23). Any license authorizations not tied directly to the existing Washington regulations

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	would be based on NRC guidance or NRC standard license condition.
Definitions:	**Waste** means those low-level radioactive wastes that are acceptable for disposal in a land disposal facility. For the purposes of this definition, low-level waste has the same meaning as in the Low-Level Radioactive Waste Policy Amendments Act of 1985, Public Law 99-240, that is, radioactive waste not classified as high-level radioactive waste, spent nuclear fuel, or by-product material as defined in section 11e.(2) of the Atomic Energy Act (uranium or thorium tailings and waste). **Radioactive waste** means any radioactive material which is no longer of use and intended for disposal or treatment for the purposes of disposal. **Disposal** means the isolation of wastes from the biosphere inhabited by man and his food chains by emplacement in a land disposal facility. **Effluent** is discussed in the introduction to WAC 246-221-290. Table II "Effluent Concentrations" The columns in Table II of this appendix captioned "Effluents," "Air" and "Water" are applicable to the assessment and control of dose to the public, particularly in the implementation of the provisions of WAC 246-221-070. The concentration values given in Columns 1 and 2 of Table II are equivalent to the radionuclide concentrations which, if inhaled or ingested continuously over the course of a year, would produce a total effective dose equivalent of 0.50 mSv (0.05 rem). **Byproduct material** means: (a) 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, and (b) the tailings or wastes produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material content, including discrete surface wastes resulting from uranium or thorium solution extraction processes. Underground ore bodies depleted by these solution extraction operations do not constitute "byproduct material" within this definition.

November 2, 1999

ALL AGREEMENT STATES
MINNESOTA, OKLAHOMA, PENNSYLVANIA, WISCONSIN

OTHER INFORMATION: REQUEST FOR TECHNICAL INFORMATION (SP-99-074)

The Nuclear Regulatory Commission (NRC) received the enclosed letter, dated October 25, 1999, from the U.S. House of Representatives Committee on Commerce. The letter requests a response to 45 questions. Two of the questions, numbers 42 and 43, require information from Agreement States so that a complete response can be provided by NRC.

As stated in question 42, please identify whether you have a definition, and provide the definition for the following terms: waste; disposal; effluent; byproduct material; transfer; and release limits. If you have other terms similar to the above or that may be related to the release of radioactive material, please provide those definitions.

Question 43 contains several parts and we are limiting our request to you to only identify what, if any, radiological criteria (e.g., total activity, activity per unit area, or dose rate) that pertain to the unrestricted release of solid materials are used in any State standards, guidance, or State license authorizations. If the criteria differentiate between surficial and volumetric contamination, please identify that fact.

Due to the need to promptly respond, we would greatly appreciate your response by November 8, 1999. Please also note that to assist in our continuing effort to solicit public input on the release of solid materials, we also seek additional information on your current Agreement State program practices. A list of these questions is enclosed. We will appreciate your response to these questions by November 12, 1999. Please direct your responses and any questions to Tom O'Brien, Telephone: (301) 4152308 or E-mail: tjo@nrc.gov, Office of State Programs, USNRC, Washington, DC 20555-0001.

This information request has been approved by OMB 3150-0029, expiration 04/30/2001. The estimated burden per response to comply with this voluntary collection request is 3 hours. Forward any comments regarding the burden estimate to the Information and Records Management Branch (T-6 F33), U.S. Nuclear Regulatory Commission, Washington, DC 205550001, and to the Paperwork Reduction Project (3150-0189), Office of Management and Budget, Washington, DC 20503. If a document does not display a currently valid OMB control number, the NRC may not conduct or required to respond to, a collection of information.

Enclosures:
As stated

Enclosure 1 - continued

INFORMATION REQUEST ON RELEASE OF SOLID MATERIALS

We are seeking information on your current Agreement State program practices with respect to the release of solid materials (including soil), that have surface and/or volumetric contamination. The enclosed table excerpts criteria for release of sites for unrestricted use that Agreement States submitted to NRC in response to an All Agreement States Letter dated September 20, 1993 (SP-93-139). This reflects the current information we have on your State's release criteria for both Atomic Energy Act (AEA) and naturally occurring radioactive materials (NORM). Please note that this attached table was inadvertently transmitted with All Agreement States Letter dated October 29, 1999 (SP-99-073). Your response to the six questions below, with respect to surficial and/or volumetric contamination of solid materials containing AEA material or NORM, would be greatly appreciated by November 12, 1999.

1. How were your State's radiological criteria derived and to what type of materials (e.g., medical, pipe scale) do they apply? If Regulatory Guide 1.86 was used as a basis please indicate so, if another technical basis was used, please provide that basis.

2. How are your State's radiological criteria applied (e.g., through guidance, licensing actions, regulations)?

3. What surveying/monitoring methodologies are used? If NUREG/CR-5849 or MARSSIM are used, please indicate so. If a State developed or another method is used, please provide that method.

4. What type of instruments (e.g., manual versus automated, hand-held versus stationary, barrel counters versus conveyor systems) and what sensitivity (i.e., lower limit of detection) values are used as selection criteria for instruments used in demonstrating compliance with the radiological criteria provided in response to Question 1?

5. If your release criterion is zero, how do you have your licensees determine that a solid to be released is not radioactive or meets the zero criterion?

6. If any State licensees currently have volumetric release authorization, please identify the licensees and whether the quantities released are tracked, summarize the scope of these authorized activities, and provide the criteria used in granting the authorization.

Enclosure:
As stated