

# UNITED STATES NUCLEAR REGULATORY COMMISSION WASHINGTON, D.C. 20555

COMM

October 22, 1979

The Honorable Morris K. Udall, Chairman Committee on Interior and Insular Affairs U.S. House of Representatives Washington, D.C. 20515

Dear Mr. Chairman:

This is in response to your letter of September 13, 1979, requesting assistance for an informal study of the University of Arizona's low-level waste burial site near the town of Oracle, Arizona, being conducted by members of the Arizona State Legislature's House of Representatives, headed by Representative Marjory Ollson.

The information requested is as follows:

1. 'A description of the regulatory responsibilities for this site of the State and the Federal government, and of the regulatory relationship tetween those bodies."

The State of Arizona tecame an Agreement State May 15, 1967. Under the agreement, the former Atomic Energy Commission, now the Nuclear Regulatory Commission, relinquished and Arizona assumed regulatory authority over source material, by-product material and special nuclear material in quantities not sufficient to form a critical mass. The State presently administers about 300 radioactive materials licenses pursuant to this Agreement. Their administrative functions include issuance of regulations and licenses, inspection of their licensees' attivities, and the handling of enforcement actions. The University of Arizona was a licensee of the AEC until 1967, at which time licensing authority for that institution was transferred to the State of Arizona, whose regulatory program is reviewed annually by the NRC to ensure both compatibility with IRC's regulatory program and adequate protection of public health and safety.

 "A copy of regulations and guidelines enforced by the NRC for licensing of similar types of waste disposal, and a comparison of these with the regulations enforced by the State for the Oracle facility."

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Enclosed is a copy of 10 CFR 20.304, <u>Disposal by Burial in Soil</u> (Enclosure A). There are no special guidelines for licensing similar types of waste sites because each such site is restricted to waste produced by a single facility only; hence waste disposal pursuant to 10 CFR 20.304 is not separately licensed. Enclosed is a copy of the State of Arizona's regulations R-12-1-419, <u>Disposal by Burial in Soil</u> (Enclosure B) which is identical to the NRC regulation.

NRC staff is presently preparing for public comment a proposal to delete 10 CFR 20.304, which allows a licensee to bury small quantities of radionuclides without Commission permission; this would mean that the licensee would have to obtain permission to perform such burials in the future. If approved, the proposed rule change would become effective in June, 1980. Assuming that the Arizona AEC changed its regulations in a similar fashion, the University would be required to seek permission from the Arizona AEC before disposing of its low-level wastes.

For detailed information on current license conditions and burial rates concerning the Oracle site, Representative Ollson may contact Mr. Ken Geiser of the Arizona Atomic Energy Commission in Phoenix at 602/255-4345.

3. "Information regarding the extent to which the NRC has made or-site inspections of the Oracle facility, including the dates of inspections over the past several years, if any, and any inspection reports which may exist."

A review of retired AEC inspection reports shows that four inspections were made at the University of Arizona, License No. 2-756-16, during the period February, 1963 to February, 1967. As a result of an AEC inspection at the University in 1967, an item of noncompliance was noted regarding excess burial at the site on one occasion. Copies of the AEC's enforcement correspondence and the University's response are contained in Enclosure C. There have been no further AEC or NRC inspections since May, 1967, when Arizona assumed regulatory authority.

4. "Any correspondence which may exist concerning the site or related University of Arizona activities between the University and the Commission."

In addition to the aforementioned enforcement-related correspondence, we have included as Enclosure D copies of the correspondence between the University and the AEC relating to the licensing of the Oracle site.

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I hope this information will be he'pful to Representative Ollson's study group. Mr. Geiser can assist with obtaining information on the post-1967 activities of the University at the Oracle site.

Sincerely,

Joseph M. Hendrie

Chairman

Enclosures: As stated

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#### § 20.207 Storage and control of licensed materials in unrestricted areas.

(a) Licensed materials stored in an unrestricted area shall be secured from unauthorized removal from the place of

(b) Licensed materials in an unrestricted area and not in storage shall be tended under the constant surveillance

and immediate control of the licensee.

#### WASTE DISPOSAL

#### § 20.301 General requirement.

No licensee, shall dispose of licensed material except:

(a) By transfer to an authorized recipient as provided in the regulations in Fart 30, 40, or 70 of this chapter, whichever may be applicable; or

(b) As authorized pursuant to

1 20.302; or

(c) As provided in \$ 20.303 or 1 20 304. applicable respectively to the disposal of licensed material by release into sanitary sewerage systems or burial in soil, or in \$ 20.106 ( Radioactivity in Timents to Unrestricted Areas)

#### 20.302 Method for obtaining approval of proposed disposal procedures.

\* a) Any licensee or applicant for a license may apply to the Commission for approval of proposed procedures to dispose of licensed material in a manner not otherwise authorized in the regulations in this chapter. Each application should a include a description of the licensed mater.al and any other radioactive material at olved, including the quantities and in ds of such material and the levels of sadioactivity involved, and the proposed manner and conditions of disposal. The a plantion should also include an anal-18.5 and evaluation of pertinent informstion at to the nature of the environment. icorological, and hydrological characteristics: usage of ground and surface saters in the general area; the nature and location of other potentially affected facilities; and procedures to be observed to minimize the risk of unexpected or hauardous exposures.

b) The Commission will not approve any application for a license to receive idensed material from other persons for disposal on land not owned by the Federal government or by a State government.

(c) The Commission will not approve any application for a license for disposal of licensed material at sea unless the applicant shows that sea disposal offers less harm to man or the environment than other practical alternative methods of disposal.

#### 20.303 Disposal by release into sanitary sewerage systems.

No licensee shall discharge licensed material into a sanitary sewerage system 1111 - 134

it is readily soluble or dispersible

in water; and

ib) The quantity of any licensed or other radioactive material released into the system by the licensee in any one

day does not exceed the larger of subparagraphs (1) or (2) of this paragraph:

(1) The quantity which, if diluted by the average ually quantity of sewage released into the sewer by the licensee, will result in an average concentration equal to the limits specified in Appendix B. Table I, Column 2 of this part; or

(2) Ten times the quantity of such material specified in Appendix C of this

part: and

(c) The quantity of any licensed or other radioactive material released in any one month, if diluted by the average monthly quantity of water released by the licensee, will not result in an average concentration exceeding the limits specified in Appendix B, Table I, Column 2 of this part; and

(d) The gross quantity of licensed and other radioactive material released into the sewerage system by the licensee does

not exceed one curie per year.

Exercts from individuals undergoing medical diagnosis or therapy with radioactive material shall be exempt from any limitations contained in this section.

## § 20.304 Disposal by burial in soil.

No licensee shall dispose of licensed material by burial in soil unless:

(a) The total quantity of licensed and other radioactive materials buried at any one location and time does not exceed, at the time of burial, 1,000 times the amount specified in Appendix C of this part; and

(b) Burial is at a minimum depth of

four feet; and

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

#### § 20.305 Treatment or disposal by incineration.

No licensee shall treat or dispose of licensed material by incineration except as specifically approved by the Commission pursuant to \$1 20.106(b) and 20.302.

### PECORDS, REPORTS, AND NOTIFICATION

#### § 20.401 Records of surveys, radiation monitoring, and disposal.

(a) Each licensee shall maintain records showing the radiation exposures of all individuals for whom personnel monitoring is required under \$ 20.202 of the & regulations in this part. Such records shall be kept on Form NRC-5, in accordance with the instructions contained in. that form or on clear and legible records containing all the information required by Form NRC-5. The doses entered on the forms or records shall be for periods of time not exceeding one calendar quarter.

(b) Fach licensee shall maintain records in the same units used in this part, showing the results of surveys required by { 20.201(b), monitoring required by §§ 20.205(b) and 20.205(c), and disposals made under §§ 20.302, 20.303, and 20.304.

(c) (1) Records of individual exposure to radiation and to radioactive material

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which must be maintained pursuant D the provisions of paragraph (a) of this section and records of bioassays, inclusing results of whole body counting eraminations, made pursuant to \$ 20.101, shall be preserved until the Commission authorizes disponition.

(2) Records of the results of surveys and monitoring which must be mailtained pursuant to paragraph (b) of this section shall be preserved for two years after completion of the survey except that the following records shall be maiztained until the Commission authorizes their disposition: (i) records of the results of surveys to determine complance with \$ 20.103(a); (fi) in the atsence of personnel monitoring data, retords of the results of surveys to determine external radiation dose; and (iii) records of the results of surveys used to evaluate the release of radioactive efficents to the environment.

(3) Records of disposal of licensed meterial made pursuant to \$\$ 20,302, 20,303 or 20.304 shall be maintained until the Commission authorizes their disposition

(4) Records which must be maintained pursuant to this part may be the onginal or a reproduced copy or microform if such reproduced copy or microform is duly authenticated by authorized personmel and the microform is capable of preducing a clear and legible copy after storage for the period specified by Commission regulations.

(5) If there is a conflict between the Commission's regulations in this parlicense condition or technical specifcation, or other written Commission atproval or authorization pertaining to the retention period for the same type of record the retention period specified in the regulations in this part for such records shall apply unless the Commission pursuant to | 20.501, has granted a specific exemption from the record retention requirements specified in the regulations in this part.

#### £ 20.102 Reports of theft or less of licensed materal.

(a) Each licenses shall report by elephonet to the Director of the appropriate Nuclear Regulatory Commission Inspection and Enforcement Regional Office listed

in Appendix D. immediately after its ocgurrence becomes known to the licenses mmy less or their of Licensed material in such quantities and under such circumstances that it appears to the licenses that a substantial hazard may result to persons in unrestanced areas.

(b) Each licensee who is required to make a report pursuant to paragrapi (a) of this section shall, within thirty (30) days after he learns of the loss o. theft, make a recort in writing to the appropriate NRC Regional Office liste: in Appendix D with copies to the Director of Inspection and Enforcement, U.S. Nuclear Regulator, Commisser, Wassington, D.C. 2055; setting forth the forlowing information:

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† Amenued 42 1 R 43-55

## PART 20 STANDARDS FOR PROTECTION AGAINST

Americium-241 01 Antimony-122 100 Antimony-124 10 Antimony-125 100 Arsenic-73 100 Arsenic-73 100 Arsenic-75 100 Arsenic-76 100 Arsenic-77 100 E-vium-131 100 E-vium-131 100 E-vium-140 100 E-vium-140 100 E-vium-140 100 E-vium-150 100 Cadmium-160 100 Cadmium-150 100 Cadmium-150 100 Cadmium-150 100 Calcium-47 100 Carbon-14 100 Carloum-141 100 Cerium-141 100 Cerium-144 110 Cerium-144 110 Cerium-145 100 Cesium-136 100 Cesium-137 100 Cesium-138 100 Cesium-138 100 Cesium-138 100 Cesium-138 100 Cesium-138 100 Cesium-139 100 Cesium-139 100 Cesium-130 100 Cesium-140 100 Cesium-150 100 E-vium-150	APPRINGE C	
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Platinum-197	
Piutonium-239	
Polonium-210	
Potassium-42	
Presendymium-142	
Praseodymium-143	10
Promethium-149	
Radium-226	
Rhenium-186	
Rhenium-188	100
Rhodium-103m	100
Rhodium-105	
Rubidium-86	10
Rubidium-87	100
Ruthenium-103	100
Ruthenium-105	10
Ruthenium-106	1
Samarium-151	10
Samarium-153	
Scandium-68	
Scandium-47 Scandium-48	
Selenium-75	
Silicon-31	100
Silver-105	10
Silver-110m	1
Silver-111	
Sodium-24	
Strontium-85	10
Strontium.90	
Strontlum-91	
Strontium-92	10
Sulphur-35	100
Tantalum-182	
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Technetium-97	
Technetium-99	
Tellurium-125m	10
Tellurium-127m	10
Tellurium-127	100
Tellurium-129m	10
Tellurium-129	100
Tellurium-132	10
Terbium-160	10
Thallium-200	100
Thallium-201	100
Thallium-202	100
Thallium 204	
Thulium-170	
Thullum-171	
Tin-113	10
Tin-125	10
Tungsten-181	10
Tungsten-185 Tungsten-187	10
Tungsten-187	100
*Uranium (natural)* Uranium-233	100
Uranium-234 - Uranium-235.	01
Vanadium-48	
Xenon-131m	1,000
Xenon+133	100
Xenon-135	100
Ytterbium-175	100
Yttrium-90	10
Yttrium-91	10
Yurum-93	100
	100
Zing-65	
Zinc-65	
Zinc-69m Zinc-69	1,000
Zinc-65	100

any alpha emitting radionuclide not listed above or mixtures of alpha emitters of unknown composition ...... Any radionuclide other than alpha emitting radionuclides, not listed above or mixtures of beta emitters of unknown composition ...

Note: For purposes of \$6 20.203 and 20.304. where there is involved a combination of iso-topes in known amounts the limit for the combination should be derived a follows:
Determine, for each isotope in the combination, the ratio between the quantity present
in the combination and the limit otherwise in the combination and the limit otherwise established for the specific isotope when not in combination. The sum of such ratios for all the isotopes in the combination may not exceed "1" (i.e., "unity"). Example: For purposes of \$20.304, if a particular tatch contains 20.000 µCit of Au<sup>198</sup> and \$5.000 µCit of Ci<sup>4</sup>, it may also include not more than 300 µCit of I<sup>131</sup>. This limit was determined as follows: as follows:

† 20,000 pct Au<sup>194</sup> + 50,000 pct c<sup>14</sup> + 300 pct t<sup>131</sup> + 1 100,000 pct + 1,500 pct 1 1 1 1 + 1

The denominator in each of the above ratios was obtained by multiplying the figure in the table by 1,000 as provided in § 20.304.

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T Amended 38 I R 29314

ENCL. A

Based on alpha disintegration rate of Th-232. Th-230 and their daughter products. \*Based on alpha disintegration rate of U-238, U-234, and U-235.

Amended 36 1 R 16898.

Amended 39 1 R 23990

G. Each licensee or registrant shall establish and maintain procedures for safely opening packages in which radioactive material is received, and shall assure that such procedures are followed and that due consideration is given to special instructions for the type of package being opened. R12-1-416. General requirement - waste disposal No licensee shall dispose of any radioactive material except: 1. By transfer to an authorized recipient as provided in Article 3, or 2. As authorized pursuant to R12-1-407, 417, 418, or 419. R12-1-417. Method of obtaining approval of proposed disposal procedures Any person may apply to the AAEC for approval of proposed procedures to . dispose of radioactive material in a manner not otherwise authorized in this Article. Each application shall include a description of the radioactive material, including the quantities and kinds of radioactive material and the levels of radioactivity involved, and the proposed manner and conditions of disposal. The application, where appropriate, should also include an analysis and evaluation of pertinent information as to the nature of the environment, including topographical, geological, meterological, and hydrological characteristics; usage of ground and surface waters in the general area; the nature and location of other potentially affected facilities; and procedures to be observed to minimize the risk of unexpected or hazardous exposures.

The AAEC will not approve any application for a license to receive radioactive material from other persons for disposal on land not owned by the

State of Arizona or the Federal Government.

R12-1-418. Disnosal by release into sanitary severage systems

4. No licensee shall discharge radioactive material into a sanitary sewerage system unless:

1. It is readily soluble or dispersible in water; and,

The quantity of any radioactive material released into the system by the licensee in any one day does not exceed the larger of a. or b. of this item:

a. The quantity which, if diluted by the average daily quantity of ' sewage released into the sewer by the licensee, will result in an average concentration not greater than the limits specified in Appendix A, Table 1, Column 2, of this Article; or

b. Ten times the quantity of such material specified in Appendix B of

this Article; and,

3. The quantity of any radioactive material released in any one month, if diluted by the average monthly quantity of water released by the licensee, will not result in an average concentration exceeding the limits specified in Appendix A, Table I, Column 2, of this Article, and,

4. The gross quantity of radioactive material released into the sewer-

ace system by the lice 'ee does not exceed one curie per year.

B. Excreta from individuals undergoing medical diagnosis or therapy with radioactive material shall be exempt from any limitations contained in 217-1-418.

Encl.B

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No licensee shall dispose of radioactive material by burial in soil unless: 1. The total quantity of radioactive materials buried at any one location and time does not exceed, at the time of burial, 1,000 times the amount specified in Appendix B of this Article; and,

2. Burial is at a minimum depth of four feet; and,

3. Successive burials are separated by distances of at least six feet and not more than 12 burials are made in any year.

R12-1-420. Disposal by incinération

No licensee shall incinerate radioactive material for the purpose of disposal or preparation for disposal except as specifically approved by the AAEC pursuant to R12-1-407 and R12-1-417.

R12-1-421. Records of surveys, radiation monitoring, and disposal

A. Each licensee or registrant shall maintain records showing the radiation exposures of all individuals for whom personnel monitoring is required under R12-1-410 of this Article. Such records shall be kept on Form AAEC-8, in accordance with the instructions contained in that form or on clear and legible records containing all the information required by Form AAEC-8. The doses entered on the forms or records shall be for periods of time not exceeding one calendar quarter.

B. Each licensee or registrant shall maintain records in the same units used in this Article, showing the results of surveys required by R12-1-409

and disposals made under R12-1-417, 418 and 419.

C. Records of individual exposure to radiation and to radioactive material which must be maintained pursuant to the provisions of A. immediately above and records of bio-assays, including results of whole body counting examinations, made pursuant to R12-1-403 shall be preserved indefinitely or until the AAEC authorizes their disposal. Records which must be maintained pursuant to this subsection may be maintained in the form of microfilms.

D. This discontinuance of or curtailment of activities, does not relieve. the licensee or registrant of responsibility for retaining all records required by R12-1-421. A licensee or registrant may, however, request the AAEC to accept such records. The acceptance of the records by the AAEC relieves the licensee or registrant of subsequent responsibility only in respect to their preservation as required by R12-1-421.

R12-1-422. Reports of theft or loss of sources of radiation

Each licensee or registrant shall report by telephone and telegraph to the AAEC the theft or loss of any source of radiation immediately after such occurence becomes known.

R12-1-423. Notification of incidents

A. Immediate Notification. Each licensee or registrant shall immediately notify the AAEC by telephone and telegraph of any incident involving any source of radiation possessed by him and which may have caused or threatens

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#### ARTICLE

# APPENDIX B

(For use in R12-1-411, R12-1-418, and R12-1-419)

Material	Microcuries
Americium-241	0.01
Antimony-122	100
Antimony-124	10
Antimony-125	10
Arsenic-73	100
Arsenic-74	10
Arsenic-76	100
Arsenic-77 Barium-131	10
Barium-133	10
Barium-140	10
Bismuth-210	1
Bromine-82	10
Cadmium-109	10
Cadmium-115m	10
Cadmium-115	100
Calcium-45	10
Calcium-47	10
Carbon-14	100
Cerium-141	100
Cerium-143	100
Cerium-144	1 000
Cesium-131	1,000
Cesium-134m	1
Cesium-134 Cesium-135	10
Cesium-135	10
Cesium-137	10
Chlorine-36	10
Chlorine-38	10
Chromium-51	1,000
Cobalt-58m	10
Cobalt-58	10
Cobalt-60	1
Copper-64	100
Dysprsium-165	10 .
Dysprosium-166	100
Erbium-169	100
Erbium-171	100
Europium-152 (9.2 h)	100
Europium-152 (13 yr)	1

Material	Hicrocuries
Europium-154 Europium-155 Fluorine-18 Gadolinium-153 Gadolinium-159 Gallium-72 Germanium-71 Gold-198 Gold-199 Hafnium-181 Holmium-166 Hydrogen-3 Indium-113m Indium-115m Indium-115 Iodine-125 Iodine-125	1 10 1,000 100 100 100 100 100 100 100 1
Iodine-129 Iodine-131 Iodine-132 Iodine-133 Iodine-134 Iodine-135 Iridium-192 Iridium-194 Iron-55 Iron-59 Krypton-85 Krypton-87 Lanthanum-140 Lutetium-177 Manganese-54 Manganese-54 Manganese-54 Manganese-56 Mercury-197 Mercury-197 Mercury-197 Mercury-203 Molybdenum-99 Neodymium-147 Neodymium-147 Neodymium-149 Nickel-63 Nickel-63 Nickel-65 Niobium-95 Niobium-95 Niobium-97 Osmium-185	0.1 10 10 10 100 100 100 100 100

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Material Material	Microcuries
Osmium-191m Osmium-193 Palladium-103 Palladium-109 Phosphorus-32 Platinum-191 Platinum-193m Platinum-197m Platinum-197 Plutonium-239 Polonium-210 Potassium-42 Praseodymium-143 Promethium-147 Promethium-149 Radium-226 Rhenium-186 Rhenium-186 Rhenium-188 Rhodium-105 Rubidium-86 Rubidium-87 Ruthenium-105 Ruthenium-105 Ruthenium-105 Samarium-151 Samarium-151 Samarium-153 Scandium-45 Scandium-45 Scandium-47 Scandium-48 Selenium-75 Silicon-31 Silver-105 Silver-110 Silver-111 Sodium-24	Microcuries  100 100 100 100 100 100 100 100 100 1
Strontium-85 Strontium-89 Strontium-90 Strontium-91 Strontium-92 Sulphur-35 Tantalum-132 Technetium-96	10 1 0.1 10 10 100 100

Material	!licrocuries
Technetium-97m	100
Technetium-97	100
Technetium-99m	100
Technetium-99	10
Tellurium-125m	10
Tellurium-127m	10
Tellurium-127	100
Tellurium-129m	10
Tellurium-129	100
Tellurium-131m	10
Tellurium-132	10
Terbium-160	10
Thallium-200	100
Thallium-201	100
Thallium-202	100
Thallium-204	10
Thorium (natural)1/	100
Thulium-170	10
Thulium-171	10
Tin-113	10
Tin-125	10
Tungsten-181	10
Tungsten-185	10
Tungsten-187	100
Uranium (natural)2/	100
Uranium-233	0.01
Uranium-234 -	
Uranium-235	0.01
Vanadium-43	10
Xenon-131m	1,000
Xenon-133	100
Xenon-135	100
Ytterbium-175	100
Yttrium-90	10
Yttrium-91	10 10
Yttrium-92	100
Yttrium-93	100
Zinc-65	10
Zinc-69m	100
Zinc-69	1,000
Zirconium-93	10
Zirconium-95	10
Zirconium-97	10

Based on alpha disintegration rate of Th-232, Th-230 and their daughter products.

Based on alpha disintegration rate of U-233, U-234, and U-235.

Any alpha emitting radionuclide not listed above or mixtures of alpha emitters of unknown composition

0.01

Any radionuclide other than alpha emitting radionuclides, not listed above or mixtures of beta emitters of unknown composition

0.1

NOTE: For purposes of R12-1-411, R12-1-418, and R12-1-419, where there is involved a combination of isotopes in known amounts, the limit for the combination should be derived as follows: Determine, for each the combination and the limit otherwise established for the specific isotope when not in combination. The sum of such ratios for all the Example: For purposes of R12-1-419, if a particular batch contains more than 300 uCi of I-131. This limit was determined as follows:

20,000 uCi Au-198/1000,000 uCi + 50,000 uCi C-14/100,000 uCi + 300 uCi I-131/1,000 uCi = 1.

The denominator in each of the above ratios was obtained by multiplying the figure in the table by 1,000 as provided in R12-1-413.

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