

G.O.C. STAFF RULE ABSTRACT

DEPARTMENT: Environment and Conservation
DIVISION: Radiological Health
SUBJECT: Rule Reorganization
STATUTORY AUTHORITY: Tennessee Code Annotated, Section 68-202-101 et seq.
EFFECTIVE DATES: May 22, 2012 through June 30, 2013
FISCAL IMPACT: Minimal

STAFF RULE ABSTRACT:

These rulemaking changes reflect a reorganization of all TDEC rules in order to be more logical and user friendly. This rulemaking affects Chapters 1200-02-04, 1200-02-05, 1200-02-06, 1200-02-07, 1200-02-08, 1200-02-09, 1200-02-10, 1200-02-11 and 1200-02-12. Its various additions and modifications will incorporate:

- a. Changes to the numbering designation of Radiological Health rules from 1200-02 to 0400-20;
- b. Correcting typographical errors throughout all Chapters; and
- c. Deleting obsolete language.

Regulatory Flexibility Addendum

Pursuant to T.C.A. § 4-5-401 through 4-5-404, prior to initiating the rule making process as described in T.C.A. § 4-5-202(a)(3) and T.C.A. § 4-5-202(a), all agencies shall conduct a review of whether a proposed rule or rule affects small businesses.

(If applicable, insert Regulatory Flexibility Addendum here)

- (1) The type or types of small business and an identification and estimate of the number of small businesses subject to the proposed rule that would bear the cost of, or directly benefit from the proposed rule:

This rulemaking that changes the rule numbers from Chapter 1200-20-04 and that makes other housekeeping changes makes no substantive changes. Therefore, there is no impact on small business.

- (2) The projected reporting, recordkeeping, and other administrative costs required for compliance with the proposed rule, including the type of professional skills necessary for preparation of the report or record:

There are no projected additional reporting, recordkeeping or administrative costs as a result of this rulemaking.

- (3) A statement of the probable effect on impacted small businesses and consumers:

There is no expected adverse affect on small businesses as a result of this rulemaking.

- (4) A description of any less burdensome, less intrusive or less costly alternative methods of achieving the purpose and objectives of the proposed rule that may exist, and to what extent the alternative means might be less burdensome to small business:

The Department is unaware of alternatives to the proposed rules.

- (5) A comparison of the proposed rule with any federal or state counterparts:

There is no exact match with any federal or state counterparts.

- (6) Analysis of the effect of the possible exemption of small businesses from all or any part of the requirements contained in the proposed rule.

Due to the administrative nature of this rulemaking small businesses could not be exempt from this rulemaking.

Impact on Local Governments

Pursuant to T.C.A. 4-5-220 and 4-5-228 “any rule to proposed to be promulgated shall state in a simple declarative sentence, without additional comments on the merits of the policy of the rules or regulation, whether the rule or regulation may have a projected impact on local governments.” (See Public Chapter Number 1070 (<http://state.tn.us/sos/acts/106/pub/pc1070.pdf>) of the 2010 Session of the General Assembly)

The Department does not anticipate that these amended rules will have a financial impact on local governments.

Public Hearing Comments

One copy of a document containing responses to comments made at the public hearing must accompany the filing pursuant to T.C.A. §4-5-222. Agencies shall include only their responses to public hearing comments, which can be summarized. No letters of inquiry from parties questioning the rule will be accepted. When no comments are received at the public hearing, the agency need only draft a memorandum stating such and include it with the Rulemaking Hearing Rule filing. Minutes of the meeting will not be accepted. Transcripts are not acceptable.

No comments were received during the comment period.

**Department of State
Division of Publications**

312 Rosa L. Parks Avenue, 8th Floor Snodgrass/TN Tower
Nashville, TN 37243
Phone: 615-741-2650
Fax: 615-741-5133
Email: register.information@tn.gov

For Department of State Use Only

Sequence Number: REDLINE
Rule ID(s): _____
File Date: _____
Effective Date: _____

Rulemaking Hearing Rule(s) Filing Form

Rulemaking Hearing Rules are rules filed after and as a result of a rulemaking hearing. TCA Section 4-5-205

Agency/Board/Commission:	Environment and Conservation
Division:	Radiological Health
Contact Person:	Beth Murphy
Address:	3 rd Floor L&C Annex 401 Church Street Nashville, Tennessee
Zip:	37243-1532
Phone:	(615) 532-0392
Email:	beth.murphy@tn.gov

Revision Type (check all that apply):

- Amendment
 New
 Repeal

Rule(s) Revised (ALL chapters and rules contained in filing must be listed here. If needed, copy and paste additional tables to accommodate multiple chapters. Please enter only ONE Rule Number/Rule Title per row)

Chapter Number	Chapter Title
0400-20-04	General Provisions
Rule Number	Rule Title
0400-20-04-.01	Purpose
0400-20-04-.02	Scope
0400-20-04-.03	Effective Date
0400-20-04-.04	Definitions
0400-20-04-.05	Reserved
0400-20-04-.06	Reserved
0400-20-04-.07	Notifications, Reports and Other Communications
0400-20-04-.08	Applications for Exemptions
0400-20-04-.09	Prohibited Uses of Sources of Radiation
0400-20-04-.10	Proprietary Information
0400-20-04-.11	Posting of Notices to Employees
0400-20-04-.12	Instructions to Workers
0400-20-04-.13	Deliberate Misconduct

Chapter Number	Chapter Title
1200-02-04	General Provisions
Rule Number	Rule Title
1200-02-04-.01	Purpose
1200-02-04-.02	Scope
1200-02-04-.03	Effective Date
1200-02-04-.04	Definitions

1200-02-04-.05	Repealed
1200-02-04-.06	Repealed
1200-02-04-.07	Notifications, Reports and Other Communications
1200-02-04-.08	Applications for Exemptions
1200-02-04-.09	Prohibited Uses of Sources of Radiation
1200-02-04-.10	Proprietary Information
1200-02-04-.11	Posting of Notices to Employees
1200-02-04-.12	Instructions to Workers
1200-02-04-.13	Deliberate Misconduct

(Place substance of rules and other info here. Statutory authority must be given for each rule change. For information on formatting rules go to <http://tn.gov/sos/rules/1360/1360.htm>)

Repeal

Chapter 1200-02-04 General Provisions is repealed.

Authority: T.C.A. §§ 68-202-101 et seq., 68-202-201 et seq., and 4-5-201 et seq.

New Rules

Chapter 0400-20-04 General Provisions

Table of Contents

0400-20-04-.01 Purpose	0400-20-04-.08 Applications
0400-20-04-.02 Scope	0400-20-04-.09 Prohibited Uses of Sources of Radiation
0400-20-04-.03 Effective Date	0400-20-04-.10 Proprietary Information
0400-20-04-.04 Definitions	0400-20-04-.11 Posting of Notices to Employees
0400-20-04-.05 Reserved	0400-20-04-.12 Instructions to Workers
0400-20-04-.06 Reserved	0400-20-04-.13 Deliberate Misconduct
0400-20-04-.07 Notifications, Reports and Other Communications	

~~1200-02-04-.01~~ 0400-20-04-.01 Purpose.

These regulations are intended to establish standards of radiation protection and are promulgated pursuant to provisions of ~~Chapter 23~~, Tennessee Code Annotated, Title 68, Chapter 202 and do not in any way exempt any person from the provisions of the Code. These regulations are intended to be consistent with the safe use of radiation machines and radioactive materials.

Authority: T.C.A. §§ 68-202-101 et seq. and 4-5-201 et seq.

~~1200-02-04-.02~~ 0400-20-04-.02 Scope.

Except as otherwise specifically provided, these regulations apply to all persons who receive, possess, use, transfer, own or acquire any source of radiation, provided, however, that nothing in these regulations shall apply to any person to the extent such person is subject to regulations by the U.S. Nuclear Regulatory Commission.

Authority: T.C.A. §§ 68-202-101 et seq. and 4-5-201 et seq.

~~1200-02-04-.03~~ 0400-20-04-.03 Effective Date.

The provisions of these regulations shall be effective on the date of issue.

Authority: T.C.A. §§ 68-202-101 et seq. and 4-5-201 et seq.

~~1200-02-04-.04~~ 0400-20-04-.04 Definitions.

(1) As used in these regulations, these terms have the definitions set forth below. (For additional definitions used only in Chapters ~~1200-02-05~~ 0400-20-05, ~~1200-02-06~~ 0400-20-06, ~~1200-02-07~~ 0400-20-07, ~~1200-02-08~~ 0400-20-08 and ~~1200-02-09~~ 0400-20-09, see Rules ~~1200-02-05-.32~~ 0400-20-05-.32, ~~1200-02-06-.03~~ 0400-20-06-.03, ~~1200-02-07-.05~~ 0400-20-07-.05, ~~1200-02-08-.03~~ 0400-20-08-.03 and ~~1200-02-09-.03~~ 0400-20-09-.03.)

- (a) 1. "A₁" means the maximum activity of special form radioactive material permitted in a Type A package. This value is either listed in Table A-1 of Schedule 10-6 in ~~the Appendix to Chapter 1200-02-10~~ Rule 0400-20-10-.38, or may be derived in accordance with the

procedures prescribed in Schedule 10-6 in the ~~Appendix to Chapter 1200-02-10 Rule 0400-20-10-.38.~~

2. "A₂" means the maximum activity of radioactive material, other than special form material, LSA and SCO material, permitted in a Type A package. This value is either listed in Table A-1 of Schedule 10-6 in the ~~Appendix to Chapter 1200-02-10 Rule 0400-20-10-.38,~~ or may be derived in accordance with the procedure prescribed in Schedule 10-6 in the ~~Appendix to Chapter 1200-02-10 Rule 0400-20-10-.38.~~
- (b) "Accelerator-produced radioactive material" means any material made radioactive by a particle accelerator.
- (c) "Agreement State" means any state with which the U.S. Nuclear Regulatory Commission has entered into an effective agreement under Section 274 b. of the Atomic Energy Act of 1954, as amended (73 Statute 689).
- (d) "Alert" means a classification for events that are in progress, may occur or have occurred that could lead to a release of radioactive material(s) but that the release is not expected to require a response by an offsite response organization to protect persons offsite.
- (e) "Authorized nuclear pharmacist". Defined in ~~Rule 1200-02-07-.05(4)~~ 0400-20-07-.05.
- (f) "Authorized user". Defined in ~~Rule 1200-02-07-.05(5)~~ 0400-20-07-.05.
- (g) "Barrier" means attenuating materials used to reduce radiation exposure.
1. "Primary". Barrier sufficient to attenuate the useful beam to the required degree at a distance no greater than 8 centimeters beyond the barrier.
 2. "Secondary". Barrier sufficient to attenuate scattered and leakage radiation to the required degree at a distance no greater than 8 centimeters beyond the barrier.¹
- (h) "Calibration" means the determination of:
1. The response or reading of an instrument relative to a series of known radiation values over the range of the instrument, or
 2. The strength of a source of radiation relative to a standard.
- (i) "Carrier" means a person engaged in the transportation of passengers or property by land or water as a common, contract or private carrier, or by civil aircraft.
- ~~(sss)~~(j) "Certificate holder" means a person who has been issued a certificate of compliance or other package approval by the U.S. Nuclear Regulatory Commission (U.S. NRC).
- ~~(ttt)~~(k) "Certificate of Compliance" (CoC) means the certificate issued by the U.S. NRC under 10 CFR 71 subpart D which approves the design of a package for the transportation of radioactive material.
- ~~(uuu)~~(l) "Close reflection by water" means immediate contact by water of sufficient thickness for maximum reflection of neutrons.
- ~~(vvv)~~(m) "Consignment" means each shipment of a package or groups of packages or load of radioactive material offered by a shipper for transport.
- ~~(hhh)~~(n) "Consortium" means an association of medical use licensees and a PET radionuclide production facility in the same geographical area that jointly own or share in the operation and

¹ It is reasonable to assume that individuals will not occupy the area within 8 centimeters of the barrier continuously.

maintenance cost of the PET radionuclide production facility that produces PET radionuclides for use in producing radioactive drugs within the consortium for noncommercial distributions among its associated members for medical use. The PET radionuclide production facility within the consortium must be located at an educational institution or a Federal facility or a medical facility.

~~(www)~~(o) "Containment system" means the assembly of components of the packaging intended to retain the radioactive material during transport.

~~(t)~~(p) "Conveyance" means:

1. For transport by public highway or rail: any transport vehicle or large freight container;
2. For transport by water: any vessel, or any hold, compartment, or defined deck area of a vessel including any transport vehicle on board the vessel; and
3. For transport by aircraft: any aircraft.

~~(k)~~(q) "Critical group" means the group of individuals reasonably expected to receive the greatest exposure to residual radioactivity for any applicable set of circumstances.

~~(xxx)~~(r) "Criticality safety index" (CSI) means the dimensionless number (rounded up to the next tenth) assigned to and placed on the label of a fissile material package, to designate the degree of control of accumulation of packages containing fissile material during transportation. Determination of the criticality safety index is described in ~~4200-02-10-30~~ paragraphs (10) and (11) of Rule ~~0400-20-10-30(10), (11)~~, and 10 CFR 71.59.

~~(t)~~(s) "Curie". Defined in ~~Rule 4200-02-05-34~~ 0400-20-05-34.

~~(iiii)~~(t) "Cyclotron" means a particle accelerator in which the charged particles travel in an outward spiral or circular path. A cyclotron accelerates charged particles and is commonly used for production of short half-life radionuclides for medical or veterinary use.

~~(m)~~(u) "Decommission" means to remove a facility or site safely from service and reduce residual radioactivity to a level that permits:

1. Release of the property for unrestricted use and termination of the license; or
2. Release of the property under restricted conditions and the termination of the license.

~~(yyy)~~(v) "Deuterium" means, for the purposes of ~~4200-02-10-30~~ subparagraph (5)(b) and paragraph (10) of Rule 0400-20-10-30(5)(b) and 1200-02-10-30(10), deuterium and any deuterium compounds, including heavy water, in which the ratio of deuterium atoms to hydrogen atoms exceeds 1:5000.

~~(jjjj)~~(w) "Discrete source" means a radionuclide that has been processed so that its concentration within a material has been purposely increased for use for commercial, medical, or research activities.

~~(n)~~(x) "Disposal facility" means a land disposal site that is used for the isolation of radioactive waste from the biosphere.

~~(e)~~(y) "Distinguishable from background" means that the detectable concentration of a radionuclide is statistically different from the background concentration of that radionuclide in the vicinity of the site or, in the case of structures, in similar materials using adequate measurement technology, survey and statistical techniques.

~~(p)~~(z) Reserved.

~~(q)~~(aa) "Dose". Defined in ~~Rule 4200-02-05-32(22)~~ 0400-20-05-32.

~~(zzz)~~(bb) "DOT" and "U.S. DOT" means the United States Department of Transportation. U.S. DOT regulations are found in Code of Federal Regulations Title 49 Transportation.

- (+)(cc) "Emergency procedures" means the written pre-planned steps to be taken in the event of actual or suspected exposure of individuals to excessive radiation. This procedure should include the names and telephone numbers of individuals to be contacted as well as directives for processing the film badge or other personnel-monitoring device.
- (s)(dd) "Exclusive use" (or "sole use" or "full load") means sole use by a single consignor of a conveyance for which all initial, intermediate and final loading and unloading are carried out in accordance with the direction of the consignor or consignee. The consignor and the carrier shall ensure that personnel having radiological training and resources appropriate for safe handling of the consignment perform any loading or unloading. The consignor shall issue specific written instructions for maintenance of exclusive use shipment controls and include them with the shipping paper information provided to the carrier by the consignor.
- (+)(ee) "Exposure"² means a measure of the ionization produced in air by X or gamma radiation. It is the sum of the electrical charges on all of the ions of one sign produced in air, when all electrons liberated by photons in a volume element of air are completely stopped in air, divided by the mass of the air in the volume element. The special unit of exposure is the roentgen.
- (+)(ff) "Fissile material" means plutonium-238, the radionuclides: plutonium-239, plutonium-241, uranium-233, uranium-235 or any combination of these radionuclides. Fissile material means the fissile nuclides themselves, not material containing fissile nuclides. Unirradiated natural uranium and depleted uranium, and natural uranium or depleted uranium that has been irradiated in thermal reactors only, are not included in this definition. Certain exclusions from fissile material controls are provided in ~~1200-02-10-30~~ subparagraph (5)(b) of Rule 0400-20-10-30(5)(b).
- (+)(gg) "Fissile material package". See "Package"
- (+)(hh) "Former U.S. Atomic Energy Commission (AEC) or U.S. Nuclear Regulatory Commission (NRC) licensed facilities" means nuclear reactors, nuclear fuel processing plants, uranium enrichment plants, or critical mass experimental facilities where AEC or NRC licenses have been terminated.
- (+)(ii) "Generator" means a person whose activities with radioactive material are such that waste is generated that is distinctly separate and/or distinct from materials received.
- (+)(jj) "~~Graphite~~" means, for the purposes of ~~1200-02-10-30~~ subparagraph (5)(b) and paragraph (10) of Rule 0400-20-10-30(5)(b) and 1200-02-10-30(10), graphite with a boron equivalent content less than 5 parts per million and density greater than 1.5 grams per cubic centimeter.
- (+)(kk) "Human use" (or "medical use") means the intentional internal or external administration of radiation or radioactive materials to individuals under the supervision of an authorized user.
- (+)(ll) "Interlock" means a device for precluding access to any area of radiation hazard by automatically eliminating the hazard upon entry by personnel or parts of their body.
- (+)(mm) "Licensed material" means radioactive, by-product, source, or special nuclear material received, possessed, used, or transferred under a general or specific license issued by the Division pursuant to the regulations in this chapter, or issued by the U.S. NRC or an agreement state pursuant to equivalent regulations.
- (+)(nn) "Licensing State" means any state with regulations equivalent to the Suggested State Regulations for Control of Radiation relating to, and an effective program for, the regulatory control of NARM.
- (+)(oo) "Low specific activity (LSA) material" means radioactive material with limited specific activity which is nonfissile or is expected under ~~1200-02-10-30~~ subparagraph (5)(b) of Rule 0400-20-10-30, and which satisfies the descriptions and limits set forth below. Shielding materials

² It is reasonable to assume that individuals will not occupy the area within 8 centimeters of the barrier continuously.

surrounding the LSA material may not be considered in determining the estimated average specific activity of the package contents. LSA material must be in one three groups:

1. LSA-I
 - (i) Uranium and thorium ores, concentrates of uranium and thorium ores, and other ores containing only naturally occurring radioactive radionuclides which are not intended to be processed for the use of these radionuclides; or
 - (ii) Solid unirradiated natural uranium or depleted uranium or natural thorium or their solid or liquid compounds or mixtures; or
 - (iii) Radioactive material for which the A_2 value is unlimited; or
 - (iv) Other radioactive material in which the activity is distributed throughout and the estimated average specific activity does not exceed 30 times the value for exempt material activity concentration determined in accordance with Schedule 10-6 in the Appendix of in Chapter 1200-02-10 Rule 0400-20-10-38.
2. LSA-II
 - (i) Water with tritium concentration up to 20 Ci/liter (0.8 terrabequerel/liter); or
 - (ii) Other material in which the activity is distributed throughout and the average specific activity does not exceed 1 (E-4) A_2 /gram for solids and gases or 1 (E-5) A_2 /gram for liquids.
3. LSA-III. Solids (e.g., consolidated wastes, activated materials), excluding powders, that satisfy the requirements of the U.S. NRC regulations 10 CFR 71.77, in which:
 - (i) The radioactive material is distributed throughout a solid or a collection of solid objects or is essentially uniformly distributed in a solid compact binding agent (such as concrete, bitumen, ceramic, etc.); and
 - (ii) The radioactive material is relatively insoluble, or it is intrinsically contained in a relatively insoluble material, so that even under loss of packaging, the loss of radioactive material per package by leaching, when placed in water for seven (7) days, would not exceed 0.1 A_2 ; and
 - (iii) The average specific activity of the solid does not exceed 2 (E-3) A_2 /gram.

~~(ee)(pp)~~ "Low toxicity alpha emitters" means natural uranium, depleted uranium, natural thorium, uranium-235, uranium-238, thorium-232, thorium-228 or thorium-230 when contained in ores or physical or chemical concentrates or tailings; or alpha emitters with a half-life of less than ten (10) days.

~~(dd)(qq)~~ "Major processors" means persons processing or handling radioactive materials exceeding Type X quantities³ as unsealed sources or material.

~~(ee)(rr)~~ "Maximum normal operating pressure" means the maximum gauge pressure that would develop in the containment system in a period of one (1) year under the heat condition specified in 10 CFR 71.71(c)(1), in the absence of venting, external cooling by an ancillary system or operational controls during transport.

³ Type X quantities are defined in Tables RHS 2-1, RHS 2-2 and RHS 2-3 as contained in Chapter 1200-02-05 0400-20-05. For purposes of Rule 1200-02-04-04(1)(dd) 0400-20-04-04, where there is involved a combination of radioactive materials licensed, the method of deriving a Type X quantity is as specified in 1200-02-05-162 Rule 0400-20-05-162(1)(b).

- ~~(ff)~~(ss) "NARM" means any naturally occurring or accelerator-produced radioactive material. It does not include byproduct, source or special nuclear material.
- ~~(gg)~~(tt) "Natural radioactivity" means radioactivity of naturally occurring nuclides.
- ~~(hh)~~(uu) "Natural thorium" means thorium with the naturally occurring distribution of thorium isotopes (essentially 100 weight percent thorium-232).
- ~~(ii)~~(vv) "Normal form radioactive material" means radioactive material that has not been demonstrated to qualify as special form radioactive material.
- ~~(jj)~~(ww) "Operating procedures" means detailed written instructions including, but not limited to, the normal operation of equipment and movable shielding, closing of interlock circuits, manipulation of controls, radiation monitoring procedures for personnel and areas, testing of interlocks and record keeping requirements.
- ~~(ccc)~~(xx) "Optimum interspersed hydrogenous moderation" means the presence of hydrogenous material between packages to such an extent that the maximum nuclear reactivity results.
- ~~(kk)~~(yy) "Ore refineries" means all non-exempt processors of a radioactive material ore.
- ~~(ll)~~(zz) "Package" means the packaging together with its radioactive contents as presented for transport.
1. "Fissile material package" or "Type AF package", "Type BF package", Type B(U)F package" or "Type B(M)F package" means a fissile material packaging together with its fissile material contents.
 2. "Type A package" means a Type A packaging together with its radioactive contents. A Type A package is defined and must comply with the U.S. DOT regulations in 49 CFR 173.
 3. "Type B package" means a Type B packaging together with its radioactive contents. On approval, a Type B package design is designated by NRC as B(U) unless the package has a maximum normal operating pressure of more than 700 kPa (100 lbf/in²) gauge or a pressure relief device that would allow the release of radioactive material to the environment under the tests specified in 10 CFR 71.73 (hypothetical accident conditions), in which case it will receive a designation B(M). B(U) refers to the need for unilateral approval of international shipments; B(M) refers to the need for multilateral approval of international shipments. There is no distinction made in how packages with these designations may be used in domestic transportation. To determine their distinction for international transportation, see U.S. DOT regulations in 49 CFR 173. A Type B package approved before September 6, 1983, was designated only as Type B. Limitations on its use are specified in 10 CFR 71.19.
- ~~(mm)~~(aaa) "Packaging" means the assembly of components necessary to ensure compliance with the packaging requirements of this chapter. It may consist of one or more receptacles, absorbent materials, spacing structures, thermal insulation, radiation shielding and devices for cooling or absorbing mechanical shocks. The vehicle, tie-down system and auxiliary equipment may be designated as part of the packaging.
- ~~(kkkk)~~(bbb) "Particle accelerator" means any device used to impact kinetic energy to electrically charged particles including but not limited to electrons, protons, deuterons, and helium ions. For the purpose of these regulations "accelerator" includes equipment designed for and used only for the production of x-rays of 0.9 MeV or greater and equipment capable of discharging nuclear particles into a medium external to the accelerating device. For purposes of this definition, "accelerator" is an equivalent term.
- ~~(nn)~~(ccc) "Physician" means an individual licensed by the State to dispense drugs in the practice of medicine.

~~(ee)(ddd)~~ "Qualified individual". Defined in ~~Rule 1200-02-06-.03~~ 0400-20-06-.03.

~~(pp)(eee)~~ "Qualified expert" means, for purposes of ~~subparagraph (2)(g) and (m) of Rule 1200-02-09-.21~~ 0400-20-09-.21(2)(g) and (m), a person:

1. Who is certified by the American Board of Radiology in Therapeutic Radiological Physics, Radiological Physics, Roentgen-Ray and Gamma-Ray Physics or X-Ray and Radium Physics; or
2. Who has the following ⁴ minimum training and experience:
 - (i) A Master's or Doctor's degree in physics, biophysics, radiological physics or health physics;
 - (ii) One year of full-time training in therapeutic radiological physics; and
 - (iii) One year of full-time experience in a therapy facility including personal calibration and spot check of at least one teletherapy unit.

~~(qq)(fff)~~ "Rad" is defined in Rule 1200-02-05-.33 subparagraph (1)(b) of Rule 0400-20-05-.33.

~~(rr)(ggg)~~ "Radiation machine" means any device capable of producing radiation except devices that produce radiation through utilization of a radioactive material.

~~(ss)(hhh)~~ "Radioactive material" means any material, solid, liquid or gas, which emits radiation spontaneously.

~~(tt)(iii)~~ "Radiological Safety Officer" means an individual who has the knowledge and responsibility to apply appropriate radiation protection regulations and has been assigned such responsibility by the licensee or registrant.

~~(uu)(jjj)~~ "Rem" is defined in 1200-02-05-.33 subparagraph (1)(c) of Rule 0400-20-05-.33.

~~(vv)(kkk)~~ "Research and development" means theoretical analysis, exploration or experimentation; or extension of investigative findings and theories of a scientific or technical nature into practical application for experimental and demonstration purposes. Research and development includes the experimental production and testing of models, devices, equipment, materials and processes. Research and development does not include the internal or external administration of radiation or radioactive material to individuals.

~~(ww)(lll)~~ "Residual radioactivity" means radioactivity in structures, materials, soils, groundwater and other media at a site resulting from activities under the licensee's control. This includes radioactivity from all licensed and unlicensed sources used by the licensee, but excludes background radiation. It also includes radioactive materials remaining at the site as a result of routine or

⁴ Licensees or certified registrants that utilize persons who do not meet these criteria for minimum training and experience may request a variance excepting them from the requirements of using qualified experts. The request should include:

1. The name of the proposed individual,
2. A description of his or her training and experience including information similar to that specified in ~~Rule 1200-02-04-.04(1)(pp)2~~ 0400-20-04-.04,
3. Reports of at least one calibration and spot-check program based on measurements personally made by the proposed individual within the last 10 years, and
4. Written endorsement of the technical qualifications of the proposed individual from personal knowledge by a physicist certified by the American Board of Radiology in one of the specialties listed in ~~Rule 1200-02-04-.04(1)(pp)1~~ 0400-20-04-.04.

The variance request should be addressed to the Division of Radiological Health, at the address given in ~~Rule 1200-02-04-.07~~ 0400-20-04-.07.

accidental releases of radioactive material at the site and previous burials at the site, even if those burials were made in accordance with the provisions of Chapter ~~1200-02-05~~ 0400-20-05.

~~(xx)(mmm)~~ "Roentgen" (R) means the special unit of exposure. One roentgen equals 2.58×10^{-4} coulomb per kilogram of air.

~~(yy)(nnn)~~ "Sealed source" is ~~D~~defined in Rule ~~1200-02-07-05(32)~~ 0400-20-07-05.

~~(zz)(ooo)~~ "Site area emergency" means a classification for events that are in progress, may occur or have occurred that could lead to a significant release of radioactive material and that could require a response by offsite response organizations to protect persons offsite.

~~(aaa)(ppp)~~ "Source of radiation" means material that emits radiation spontaneously, or apparatus that produces, or may produce when the associated controls are operated, one or more forms of radiation.

~~(bbb)(qqq)~~ "Special form radioactive material" means radioactive material that satisfies the following conditions:

1. It either is a single solid piece or is contained in a sealed capsule that can be opened only by destroying the capsule;
2. The piece or capsule has at least one dimension not less than 5 millimeters (0.197 inch); and
3. It satisfies the requirements specified by the U.S. Nuclear Regulatory Commission 10 CFR 71.75. A special form encapsulation designed in accordance with the U.S. NRC requirements of 10 CFR 71.4 in effect on June 30, 1983 (see 10 CFR 71, revised as of January 1, 1983), and constructed before July 1, 1985, may continue to be used. A special form encapsulation designed in accordance with U.S. NRC requirements of 10 CFR 71.4 in effect on March 31, 1996, (see 10 CFR 71, revised as of January 1, 1983), and constructed before April 1, 1998, may continue to be used. Any other special form encapsulation shall meet the specifications of this definition.

~~(eee)(rrr)~~ "Special nuclear material in quantities not sufficient to form a critical mass" means:

1. Uranium enriched in the isotope U-235 in quantities not exceeding 350 grams of contained U-235;
2. Uranium-233 in quantities not exceeding 200 grams;
3. Plutonium in quantities not exceeding 200 grams; or
4. Any combination of them in accordance with the following formula. For each kind of special nuclear material, determine the ratio between the quantity of that special nuclear material and the quantity specified above for the same kind of special nuclear material. The sum of such ratios for all kinds of special nuclear material in combination shall not exceed 1 (i.e., unity). For example, the following quantities in combination would not exceed the limitation and are within the formula, as follows:

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

~~(ddd)(sss)~~ "Specific activity" means the radioactivity of a radionuclide per unit mass of that nuclide. The specific activity of a material in which the radionuclide is essentially uniformly distributed is the radioactivity per unit mass of the material.

~~(dddd)(ttt)~~ "Spent nuclear fuel or Spent fuel" means fuel that has been withdrawn from a nuclear reactor following irradiation, has undergone at least 1 year's decay since being used as a source of energy in a power reactor, and has not been chemically separated into its constituent elements

by reprocessing. Spent fuel includes the special nuclear material, byproduct material, source material, and other radioactive materials associated with fuel assemblies.

~~(fff)~~(uuu) "SRPAR" means State Regulations for Protection Against Radiation.

~~(eee)~~(vvv) "State" means a state of the United States, the District of Columbia, the Commonwealth of Puerto Rico, the Virgin Islands, Guam, American Samoa, and the Commonwealth of the Northern Mariana Islands.

~~(eee)~~(www) "Surface contaminated object" (SCO) means a solid object that is not itself classed as radioactive material but that has radioactive material distributed on any of its surfaces. SCO must be in one of two groups with surface activity not exceeding the following limits:

1. SCO-I: A solid object on which:
 - (i) The removable (non-fixed) contamination on the accessible surface averaged over 300 cm² (or the area of the surface if less than 300 cm²) does not exceed 1 E-4 microcurie (4 becquerels) per square centimeter (cm²) for beta and gamma and low toxicity alpha emitters or 1 E-5 microcuries (0.4 becquerel) per cm² for all other alpha emitters;
 - (ii) The fixed contamination on the accessible surface averaged over 300 cm² (or the area of the surface if less than 300 cm²) does not exceed 1 microcurie (4 E+4 becquerels) per square centimeter (cm²) for beta and gamma and low toxicity alpha emitters or 0.1 microcurie (4 E+3 becquerels) per cm² for all other alpha emitters; and
 - (iii) The removable (nonfixed) contamination plus the fixed contamination on the inaccessible surface averaged over 300 cm² (or the area of the surface if less than 300 cm²) does not exceed 1 microcurie (4 E+4 becquerels) per square centimeter (cm²) beta and gamma and low toxicity alpha emitters or 0.1 microcurie (4 E+3 becquerels) per cm² for all other alpha emitters.
2. SCO-II: A solid object on which the limits for SCO-I are exceeded and on which:
 - (i) The removable contamination on the accessible surface averaged over 300 cm² (or the area of the surface if less than 300 cm²) does not exceed 1 E-2 microcurie (400 becquerels) per square centimeter (cm²) for beta and gamma and low toxicity alpha emitters or 1 E-3 microcurie (40 becquerels) per cm² for all other alpha emitters;
 - (ii) The fixed contamination on the accessible surface averaged over 300 cm² (or the area of the surface if less than 300 cm²) does not exceed 20 microcuries (8 E+5 becquerels) per square centimeter (cm²) for beta and gamma and low toxicity alpha emitters or 2 microcuries (8 E+4 becquerels) per cm² for all other alpha emitters; and
 - (iii) The removable (nonfixed) contamination plus the fixed contamination on the inaccessible surface averaged over 300 cm² (or the area of the surface if less than 300 cm²) does not exceed 20 microcurie (8 E+5 becquerels) per square centimeter (cm²) for beta and gamma and low toxicity alpha emitters or 2 microcurie (8 E+4 becquerels) per cm² for all other alpha emitters.

~~(fff)~~(xxx) "Therapeutic-type protective tube housing" means:

1. For x-ray therapy apparatus not capable of operating at 500 kVp or above, the following definition applies. An x-ray tube housing so constructed that the leakage radiation at a distance of 1-meter from the target does not exceed 1 roentgen in an hour when the tube is operated at its maximum rated continuous current for the maximum rated tube potential.

2. For x-ray therapy apparatus capable of operating at 500 kVp or above, the following definition applies. An x-ray tube housing so constructed that the leakage radiation at a distance of 1-meter from the target does not exceed 0.1 percent of the useful beam exposure rate at 1-meter from the target, for any of its operating conditions.
3. In either case, small areas of reduced protection are acceptable providing the average radiation exposure over any area of 100 square centimeters at 1-meter distance from the target does not exceed the values given above. However, no linear dimension of the area used to obtain the average shall exceed 20 centimeters.
4. See ~~4200-02-06-.05~~ part (1)(a)15 of Rule 0400-20-06-.05 for leakage requirements for contact therapy apparatus.

~~(ggg)(yyv)~~ "These regulations" means "State Regulations for Protection Against Radiation."

~~(hhh)(zzz)~~ "Transport index" (TI) means the dimensionless number (rounded up to the next tenth) placed on the label of a package to designate the degree of control to be exercised by the carrier during transportation. The transport index is the number determined by the maximum radiation level in millirem per hour at 1-meter (3.3 feet) from the external surface of the package (equivalent to multiplying the maximum radiation level in millisievert(s) per hour at 1-meter (3.3 feet) by 100). The transport index is determined as follows:

1. For non-fissile material packages, the number determined by multiplying the maximum radiation level in millisievert (mSv) per hour at 1-meter (3.3 ft) from the external surface of the package by 100 (equivalent to the maximum radiation level in millirem per hour at 1-meter (3.3 ft)); or
2. For fissile material packages, the number determined by multiplying the maximum radiation level in millisievert per hour at 1-meter (3.3 ft) from the external surface of the package by 100 (equivalent to the maximum radiation level in millirem per hour at 1-meter (3.3 ft)), or, for criticality control purposes, the number obtained as described in 10 CFR 71.59, whichever is larger.

~~(iii)(aaaa)~~ "Type A quantity" means a quantity of radioactive material, the aggregate radioactivity of which does not exceed A_1 for special form radioactive material or A_2 for normal form radioactive material, where A_1 and A_2 are given in Table A-1, Schedule 10-6, Rule ~~4200-02-10-.37~~ 0400-20-10-.37, or may be determined by procedures described in Schedule 10-6, Rule ~~4200-02-10-.37~~ 0400-20-10-.37.

~~(jii)(bbbb)~~ "Type B quantity" means a quantity of radioactive material greater than a Type A quantity.

~~(gggg)(cccc)~~ "Unirradiated uranium" means uranium containing not more than $2E+3$ Bq of plutonium per gram of uranium-235, not more than $9E+6$ Bq of fission products per gram of uranium-235, and not more than $5E-3$ g of uranium-236 per gram of uranium-235.

~~(kkk)(dddd)~~ "Units of radioactivity". Defined in Rule 4200-02-05-.34 0400-20-05-.34.

~~(iii)(eeee)~~ "Unrefined and unprocessed ore" means ore in its natural form before any processing, such as grinding, roasting, beneficiating or refining.

~~(mmm)(ffff)~~ "Uranium - natural, depleted, enriched" means:

1. Natural uranium: uranium with the naturally occurring distribution of uranium isotopes (about 0.711 weight percent uranium-235, and the remainder by weight essentially uranium-238).
2. Depleted uranium: uranium containing less uranium-235 than the naturally occurring distribution of uranium isotopes.

3. Enriched uranium: uranium containing more uranium-235 than the naturally occurring distribution of uranium isotopes.

~~(nnn)~~(gggg) "Useful beam" (or "primary beam") means that part of the radiation that passes through a window, aperture, cone or other collimating device.

~~(ooo)~~(hhhh) "Waste" means those low-level radioactive wastes containing source, special nuclear, or byproduct material 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 ~~subparagraphs (11)(b), (11)(c), and (11)(d) of Rule 1200-02-05-.32~~ 0400-20-05-.32.

~~(ppp)~~(iiii) "Waste handler" means a person who holds radioactive wastes for disposal and/or who actually disposes of radioactive wastes for other persons.

~~(qqq)~~(jjjj) "Waste processor" means a waste handler who performs a physical and/or chemical activity on a material containing or contaminated with radioactive material.

~~(rrr)~~(kkkk) "Worker" means an individual engaging in work under a license or registration issued by the Division and controlled by a licensee or registrant, but does not include the licensee or registrant.

- (2) Definitions of certain other words and phrases used in these regulations are set forth in other parts of these regulations where they specifically apply.

Authority: T.C.A. §§ 68-202-101 et seq., 68-202-201 et seq. and 4-5-201 et seq.

~~1200-02-04-.05~~ 0400-20-04-.05 Reserved.

Authority: T.C.A. §§ 68-202-201 et seq. and 4-5-201 et seq.

~~1200-02-04-.06~~ 0400-20-04-.06 Reserved.

Authority: T.C.A. §§ 68-202-201 et seq. and 4-5-201 et seq.

~~1200-02-04-.07~~ 0400-20-04-.07 Notifications, Reports and Other Communications.

- (1) Address notifications and reports required by these regulations, communications concerning these regulations and applications filed thereunder as follows:

- (a) Telephone notifications and communications, 7:00 a.m. Central Time to 4:30 p.m. Central Time, except weekends and holidays:

Division of Radiological Health 615-532-0364

- (b) Telephone notifications, all other times:

Tennessee Emergency Management Agency (TEMA): 1-800-262-3300

- (c) Applications, written notifications, reports and communications:

Division of Radiological Health
Tennessee Department of Environment and Conservation
L & C Annex, Third Floor
401 Church Street
Nashville, Tennessee 37243-1532

- (d) Facsimile communications:

Division of Radiological Health 615-532-7938

(2) Reserved.

Authority: T.C.A. §§ 68-202-101 et seq. and 4-5-201 et seq.

~~4200-02-04-.08~~ 0400-20-04-.08 Applications for Exemptions.

The Department may, upon application by any person or upon its own initiative, grant exemptions, variances, or exceptions from the requirements of these regulations which are not prohibited by statute and which will not result in undue hazard to public health and safety or property.

Authority: T.C.A. §§ 68-202-101 et seq. and 4-5-201 et seq.

~~4200-02-04-.09~~ 0400-20-04-.09 Prohibited Uses of Sources of Radiation.

- (1) The use of sources of radiation may be prohibited when it is determined by the Department to be detrimental to public health and safety or property. This action to prohibit will be by issuance of a Commissioner Order or Emergency Order.
- (2) No person shall use sources of radiation in a manner to intentionally expose any individual except as specifically allowed by these regulations or by license, registration, or Certified Registration authorization. Use of sources of radiation on humans for research purposes must be specifically approved as provided for by the Department's policy on Experimental Exposure of Humans to Ionizing Radiation or in the case of radiopharmaceuticals by the U.S. Food and Drug Administration.

Authority: T.C.A. §§ 68-202-101 et seq. and 4-5-201 et seq.

~~4200-02-04-.10~~ 0400-20-04-.10 Proprietary Information.

Proprietary information is defined as the below listed information supplied to the Division pursuant to the Radiological Health Service Act and is claimed in writing by the person required to supply the information as proprietary as follows:

- (1) Blueprints and flow diagrams of the individual's manufacturing processes covered by the registration, license and and/or application;
- (2) Detailed narrative of processes including listings of raw materials, composition and manufacturing protocol;
- (3) Customer lists; and
- (4) Individual medical records and/or radiation exposure records including bioassay results.

Authority: T.C.A. §§ 68-202-101 et seq. and 4-5-201 et seq.

~~4200-02-04-.11~~ 0400-20-04-.11 Posting of Notices to Workers.

- (1) Each licensee or registrant shall post current copies of the following documents, as applicable, in a sufficient number of places to permit workers to observe them on the way to or from any particular licensed or registered activity location to which the document applies. Documents shall be placed in a conspicuous position and replaced if removed or altered:
 - (a) "State Regulations for Protection Against Radiation;"
 - (b) Radioactive material license, license conditions, documents incorporated into a license by reference and amendments thereto;
 - (c) Certified registration and amendments thereto;
 - (d) Registration of x-ray producing equipment;
 - (e) Operating and emergency procedures applicable to licensed or registered activities;

- (f) Any written notice that these regulations have been violated shall be posted within ~~two~~ 2 working days after receipt of the documents from the Division and the licensee's or registrant's response, if any, shall be posted within ~~two~~ 2 working days after dispatch from the licensee or registrant. These documents shall remain posted for a minimum of ~~five~~ 5 working days or until action correcting the violation has been completed, whichever is later.
 - (g) Form RHS 8-3 (Notice to Employees). Copies of this form may be obtained by writing the Division of Radiological Health at the address given in Rule ~~1200-02-04-07~~ 0400-20-04-07.
- (2) Instead of posting a document specified in subparagraphs ~~1200-02-04-11~~ (1)(a) through (e) of Rule 0400-20-04-11, the licensee or registrant may post a notice that describes the document and states where it may be examined.
- (3) Form RHS 8-3 (Notice to Employees).

NOTICE TO EMPLOYEES

In "STATE REGULATIONS FOR PROTECTION AGAINST RADIATION", The Tennessee Department of Environment and Conservation has established standards for your protection against radiation hazards and certain provisions for the option of workers engaged in work under licenses or registrations issued by the Department.

YOUR EMPLOYER'S RESPONSIBILITY

Your employer is required to—

1. Apply these regulations to work under the license or registration. Licenses and Certified Registrations contain special conditions which shall be considered in addition to these regulations.
2. Post or otherwise make available to you a copy of the regulations, licenses, registrations, and operating procedures which apply to work in which you are engaged, and explain their provisions to you.
3. Post any written notice from the Department that the regulations have been violated and response to such notice.

YOUR RESPONSIBILITY AS A WORKER

You should familiarize yourself with those provisions of the regulations, and the operating procedures which apply to the work in which you are engaged. You should observe their provisions for your own protection and protection of your co-workers.

AREAS COVERED BY THESE REGULATIONS

1. Limits on exposure to radiation and radioactive material in restricted and unrestricted areas;
2. Measures to be taken after accidental exposure;
3. Personnel monitoring, surveys and equipment;
4. Caution signs, labels and safety interlock equipment;
5. Exposure records and reports;
6. Option for workers regarding the Department's inspection; and
7. Related matters.

REPORTS ON YOUR RADIATION EXPOSURE HISTORY

1. The Department's regulations require that your

employer give you a written report if you receive an exposure in excess of any applicable limit as set forth in the regulations or in the license. The basic limits for exposure to employees are set forth in Rules ~~4200-02-05-50~~ 0400-20-05-50, ~~4200-02-05-53~~ 0400-20-05-53 and ~~4200-02-05-55~~ 0400-20-05-55 of the regulations. These rules specify limits on exposure to radiation and exposure to concentrations of radioactive material in air and water.

2. If you work where personnel monitoring is required and if you request information on your radiation exposures;
 - a. your employer must advise you annually of your exposure to radiation; and
 - b. your employer must give you a written report, following termination of your employment, of your radiation exposures.

INSPECTIONS

All licensed or registered activities are subject to inspection by representatives of the Department. In addition, any worker or representative of workers who believes that there is a violation of the regulations or the terms of the employer's license or registration with regard to radiological working conditions in which the worker is engaged, may request an inspection by sending a notice of the alleged violation to the Tennessee Department of Environment and Conservation, Division of Radiological Health, L&C Annex, 3rd Floor, 401 Church Street, Nashville, Tennessee 37243-1532. The request must set forth the specific grounds for the notice, and must be signed by the worker or the representative of the workers. During inspections, Department inspectors may confer privately with workers, and any worker may bring to the attention of the inspectors any past or present condition which he believes contributed to or caused any violation as described above.

POSTING REQUIREMENT

Copies of this notice must be posted in a sufficient number of places in every establishment where employees are employed in activities registered or licensed pursuant to Chapter ~~4200-02-10~~ 0400-20-10 to permit employees working in or frequenting any portion of a restricted area to observe a copy on the way to or from

their place of employment.

Authority: T.C.A. §§ 68-202-101 et seq. and 4-5-201 et seq.

~~4200-02-04-.12~~ 0400-20-04-.12 Instructions to Workers.

- (1) Each licensee or registrant is responsible that all individuals who in the course of employment are likely to receive in a year an occupational dose in excess of 100 mrem (1mSv):
 - (a)
 1. Shall be kept informed of the storage, transfer or use of sources of radiation;
 2. Shall be instructed:
 - (i) In the health protection problems associated with exposure to sources of radiation,
 - (ii) In precautions or procedures to minimize radiation exposure, and
 - (iii) In the purposes and functions of protective devices employed;
 3. Shall be instructed in, and required to observe, to the extent within the worker's control, the applicable Division regulations, registrations and licenses for the protection of individuals from sources of radiation;
 4. Shall be instructed in any operating and emergency procedures applicable to the licensed or registered activities in which the individual is involved;
 5. Shall be instructed of their responsibility to report promptly to the licensee or registrant any condition that may lead to or cause a violation of Division regulations, registration and licenses or unnecessary exposure to sources of radiation;
 6. Instructed in the appropriate response to warnings made in case of any unusual occurrence or malfunction that may involve exposure to sources of radiation;
 7. Shall be advised that workers may request radiation exposure reports under Rule ~~4200-02-05-.142~~ 0400-20-05-.142.
- (2) In determining individuals subject to paragraph (1) of this rule, licensees and registrants shall consider assigned activities during normal and abnormal situations involving exposure to sources of radiation that can reasonably occur during the life of a licensed or registered facility. The extent of these instructions shall be commensurate with potential radiological health protection problems in the work place.

Authority: T.C.A. §§ 68-202-101 et seq. and 4-5-201 et seq.

~~4200-02-04-.13~~ 0400-20-04-.13 Deliberate Misconduct.

- (1) This rule applies to any—
 - (a) Licensee or registrant;
 - (b) Certificate holder;
 - (c) Quality assurance program approval holder;
 - (d) Applicant for a license, certificate, or quality assurance program approval;
 - (e) Contractor (including a supplier or consultant) or subcontractor, to any person identified in subparagraph (1)(d) of this rule; or

- (f) Employees of any person identified in subparagraphs ~~(4)~~(a) through ~~(4)~~(e) of this rule paragraph.
- (2) A person identified in paragraph (1) of this rule who knowingly provides to any entity, listed in subparagraphs (1)(a) through ~~(4)~~(e) of this rule, any components, equipment, materials, or other goods or services that relate to a licensee's, registrant's certificate holder's, quality assurance program approval holder's, or applicant's activities under these regulations, shall not:
- (a) Engage in deliberate misconduct that causes or would have caused, if not detected, a licensee, registrant, certificate holder, quality assurance program approval holder, or any applicant to be in violation of any rule, regulation or order; or any term, condition, or limitation of any license or registration, or certificate issued by the Division; or
 - (b) Deliberately submit to the Division, a licensee, a registrant, a certificate holder, a quality assurance program approval holder, an applicant for a license or registration, certificate, or quality assurance program approval, or a licensee's or registrant's, applicant's, certificate holder's or quality assurance program approval holder's contractor or subcontractor, information that the person submitting the information knows to be incomplete or inaccurate in some respect material to the Division.
- (3) A person who violates subparagraph (2)(a) or (b) of this rule 1200-02-04-13(2)(a) or (b) may be subject to possible civil and criminal penalties.
- (4) For the purposes of subparagraph (2)(a) of this rule 1200-02-04-13(2)(a), deliberate misconduct by a person means an intentional act or omission that the person knows:
- (a) Would cause a licensee, registrant, certificate holder, quality assurance program approval holder, or applicant for a license, registration, certificate, or quality assurance program approval to be in violation of any rule, regulation, or order; or any term, condition, or limitation of any license, or registration, or certificate issued by the Division; or
 - (b) Constitutes a violation of a requirement, procedure, instruction, contract, purchase order or policy of a licensee, registrant, certificate holder, quality assurance program approval holder, applicant, contractor or subcontractor of any of them.

Authority: T.C.A. §§ 68-202-201 et seq. and 4-5-201 et seq.

G.O.C. STAFF RULE ABSTRACT

DEPARTMENT: Environment and Conservation
DIVISION: Radiological Health
SUBJECT: Rule Reorganization
STATUTORY AUTHORITY: Tennessee Code Annotated, Section 68-202-101 et seq.
EFFECTIVE DATES: May 22, 2012 through June 30, 2013
FISCAL IMPACT: Minimal
STAFF RULE ABSTRACT:

These rulemaking changes reflect a reorganization of all TDEC rules in order to be more logical and user friendly. This rulemaking affects Chapters 1200-02-04, 1200-02-05, 1200-02-06, 1200-02-07, 1200-02-08, 1200-02-09, 1200-02-10, 1200-02-11 and 1200-02-12. Its various additions and modifications will incorporate:

- a. Changes to the numbering designation of Radiological Health rules from 1200-02 to 0400-20;
- b. Correcting typographical errors throughout all Chapters; and
- c. Deleting obsolete language.

Public Hearing Comments

One copy of a document containing responses to comments made at the public hearing must accompany the filing pursuant to T.C.A. §4-5-222. Agencies shall include only their responses to public hearing comments, which can be summarized. No letters of inquiry from parties questioning the rule will be accepted. When no comments are received at the public hearing, the agency need only draft a memorandum stating such and include it with the Rulemaking Hearing Rule filing. Minutes of the meeting will not be accepted. Transcripts are not acceptable.

No comments were received during the comment period.

Regulatory Flexibility Addendum

Pursuant to T.C.A. § 4-5-401 through 4-5-404, prior to initiating the rule making process as described in T.C.A. § 4-5-202(a)(3) and T.C.A. § 4-5-202(a), all agencies shall conduct a review of whether a proposed rule or rule affects small businesses.

(If applicable, insert Regulatory Flexibility Addendum here)

- (1) The type or types of small business and an identification and estimate of the number of small businesses subject to the proposed rule that would bear the cost of, or directly benefit from the proposed rule:

This rulemaking that changes the rule numbers from Chapter 1200-20-11 and that makes other housekeeping changes makes no substantive changes. Therefore, there is no impact on small business.

- (2) The projected reporting, recordkeeping, and other administrative costs required for compliance with the proposed rule, including the type of professional skills necessary for preparation of the report or record:

There are no projected additional reporting, recordkeeping or administrative costs as a result of this rulemaking.

- (3) A statement of the probable effect on impacted small businesses and consumers:

There is no expected adverse affect on small businesses as a result of this rulemaking.

- (4) A description of any less burdensome, less intrusive or less costly alternative methods of achieving the purpose and objectives of the proposed rule that may exist, and to what extent the alternative means might be less burdensome to small business:

The Department is unaware of alternatives to the proposed rules.

- (5) A comparison of the proposed rule with any federal or state counterparts:

There is no exact match with any federal or state counterparts.

- (6) Analysis of the effect of the possible exemption of small businesses from all or any part of the requirements contained in the proposed rule.

Due to the administrative nature of this rulemaking small businesses could not be exempt from this rulemaking.

Impact on Local Governments

Pursuant to T.C.A. 4-5-220 and 4-5-228 "any rule to proposed to be promulgated shall state in a simple declarative sentence, without additional comments on the merits of the policy of the rules or regulation, whether the rule or regulation may have a projected impact on local governments." (See Public Chapter Number 1070 (<http://state.tn.us/sos/acts/106/pub/pc1070.pdf>) of the 2010 Session of the General Assembly)

The Department does not anticipate that these amended rules will have a financial impact on local governments.

**Department of State
Division of Publications**

312 Rosa L. Parks Avenue, 8th Floor Snodgrass/TN Tower
Nashville, TN 37243
Phone: 615-741-2650
Fax: 615-741-5133
Email: register.information@tn.gov

For Department of State Use Only

Sequence Number: PEDLINE
Rule ID(s): _____
File Date: _____
Effective Date: _____

Rulemaking Hearing Rule(s) Filing Form

Rulemaking Hearing Rules are rules filed after and as a result of a rulemaking hearing. TCA Section 4-5-205

Agency/Board/Commission:	Environment and Conservation
Division:	Radiological Health
Contact Person:	Beth Murphy
Address:	3 rd Floor L&C Annex 401 Church Street Nashville, Tennessee
Zip:	37243-1532
Phone:	(615) 532-0392
Email:	beth.murphy@tn.gov

Revision Type (check all that apply):

- Amendment
 New
 Repeal

Rule(s) Revised (ALL chapters and rules contained in filing must be listed here. If needed, copy and paste additional tables to accommodate multiple chapters. Please enter only ONE Rule Number/Rule Title per row)

Chapter Number	Chapter Title
0400-20-11	Licensing Requirements for Land Disposal of Radioactive Waste
Rule Number	Rule Title
0400-20-11-.01	Purpose
0400-20-11-.02	Scope
0400-20-11-.03	Definitions
0400-20-11-.04	License Required
0400-20-11-.05	Communications
0400-20-11-.06	Reserved
0400-20-11-.07	Reserved
0400-20-11-.08	Content of Application
0400-20-11-.09	Standards of Issuance
0400-20-11-.10	Amendment or Renewal
0400-20-11-.11	Application for Renewal or Closure
0400-20-11-.12	Contents of Application for Closure
0400-20-11-.13	Post Closure Observation and Maintenance
0400-20-11-.14	Transfer of License
0400-20-11-.15	Termination of License
0400-20-11-.16	Performance Objectives
0400-20-11-.17	Technical Requirements for Land Disposal Facilities
0400-20-11-.18	Financial Assurance
0400-20-11-.19	Records, Reports, Tests and Inspections

Chapter Number	Chapter Title
1200-02-11	Licensing Requirements for Land Disposal of Radioactive Waste
Rule Number	Rule Title
1200-02-11-.01	Purpose
1200-02-11-.02	Scope
1200-02-11-.03	Definitions
1200-02-11-.04	License Required
1200-02-11-.05	Communications
1200-02-11-.06	Reserved
1200-02-11-.07	Reserved
1200-02-11-.08	Content of Application
1200-02-11-.09	Standards of Issuance
1200-02-11-.10	Amendment or Renewal
1200-02-11-.11	Application for Renewal or Closure
1200-02-11-.12	Contents of Application for Closure
1200-02-11-.13	Post Closure Observation and Maintenance
1200-02-11-.14	Transfer of License
1200-02-11-.15	Termination of License
1200-02-11-.16	Performance Objectives
1200-02-11-.17	Technical Requirements for Land Disposal Facilities
1200-02-11-.18	Financial Assurance
1200-02-11-.19	Records, Reports, Tests and Inspections

(Place substance of rules and other info here. Statutory authority must be given for each rule change. For information on formatting rules go to <http://tn.gov/sos/rules/1360/1360.htm>)

Repeal

Chapter 1200-02-11 Licensing Requirements for Land Disposal of Radioactive Waste is repealed.

Authority: T.C.A. §§ 68-202-101 et seq., 68-202-201 et seq., and 4-5-201 et seq.

New Rules

Chapter 0400-20-11 Licensing Requirements for Land Disposal of Radioactive Waste

Table of Contents

0400-20-11-.01	Purpose	0400-20-11-.11	Application for Renewal or Closure
0400-20-11-.02	Scope	0400-20-11-.12	Contents of Application for Closure
0400-20-11-.03	Definitions	0400-20-11-.13	Post Closure Observation and Maintenance
0400-20-11-.04	License Required	0400-20-11-.14	Transfer of License
0400-20-11-.05	Communications	0400-20-11-.15	Termination of License
0400-20-11-.06	Reserved	0400-20-11-.16	Performance Objectives
0400-20-11-.07	Reserved	0400-20-11-.17	Technical Requirements for Land Disposal Facilities
0400-20-11-.08	Content of Application	0400-20-11-.18	Financial Assurance
0400-20-11-.09	Standards for Issuance	0400-20-11-.19	Records, Reports, Tests and Inspections
0400-20-11-.10	Amendment or Renewal		

~~1200-02-11-.01~~ 0400-20-11-.01 Purpose.

The ~~regulations~~ rules in this Chapter establish, for land disposal of radioactive waste, the procedures, criteria, and terms and conditions upon which the Department issues licenses for the disposal of radioactive wastes received from other persons.

Authority: T.C.A. §§ 68-202-101 et seq., 68-202-201 et seq., and 4-5-201 et seq.

~~1200-02-11-.02~~ 0400-20-11-.02 Scope.

The ~~regulations~~ rules in this Chapter do not apply to disposal of high level waste, disposal of uranium or thorium tailings or disposal of licensed material as provided for in Chapter ~~1200-02-05~~ 0400-20-05 by an individual licensee.

Authority: T.C.A. §§ 68-202-101 et seq., 68-202-201 et seq., and 4-5-201 et seq.

~~1200-02-11-.03~~ 0400-20-11-.03 Definitions.

- (1) "Active maintenance" means any significant remedial activity needed during the period of institutional control to maintain a reasonable assurance that the performance objectives are met. Such active maintenance includes ongoing activities such as the pumping and treatment of water from a disposal unit or one-time measures such as replacement of a disposal unit cover. Active maintenance does not include custodial activities such as repair of fencing, repair or replacement of monitoring equipment, revegetation, minor additions to soil cover, minor repair of disposal unit covers and general disposal site upkeep such as mowing grass.
- (2) "Buffer zone" means a portion of the disposal site that is controlled by the licensee and that lies under the disposal units and between the disposal units and the boundary of the site.
- (3) "Chelating agent" means amine polycarboxylic acids (e.g., EDTA, DTPA), hydroxyl-carboxylic acids and polycarboxylic acids (e.g., citric acid, carboic acid and glucinic acid).
- (4) "Commencement of construction" means any clearing of land, excavation or other substantial action that would adversely affect the environment of a land disposal facility. The term does not mean disposal site

exploration, necessary roads for disposal site exploration, borings to determine foundation conditions or other preconstruction monitoring or testing to establish background information related to the suitability of the disposal site or the protection of environmental values.

- (5) "Custodial agency" means an agency of the government designated to act on behalf of the government owner of the disposal site.
- (6) "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.
- (7) "Disposal site" means that portion of a land disposal facility which is used for disposal of waste. It consists of disposal units and a buffer zone.
- (8) "Disposal unit" means a discrete portion of the disposal site into which waste is placed for disposal.
- (9) "Engineered barrier" means a manmade structure or device that is intended to improve the land disposal facility's ability to meet the performance objectives.
- (10) "Explosive material" means any chemical compound, mixture or device which produces a substantial instantaneous release of gas and heat spontaneously or by contact with sparks or flame.
- (11) "Hazardous waste" means those wastes designated as hazardous by the Tennessee Department of Environment and Conservation, Division of Solid Waste Management.
- (12) "Hydrogeologic unit" means any soil or rock unit or zone which by virtue of its porosity or permeability, or lack thereof, has a distinct influence on the storage or movement of groundwater.
- (13) "Inadvertent intruder" means a person who might occupy the disposal site after closure and engage in normal activities, such as agriculture, dwelling construction or other pursuits in which the person might be unknowingly exposed to radiation from the waste.
- (14) "Intruder barrier" means a sufficient depth of cover over the waste that inhibits contact with waste and helps to ensure that radiation exposures to an inadvertent intruder will meet the performance objectives set forth in this Chapter or engineered structures that provides equivalent protection to the inadvertent intruder.
- (15) "Land disposal facility" means the land, buildings and equipment which are intended to be used for the disposal of radioactive wastes.
- (16) "Monitoring" means observing and making measurements to provide data to evaluate the performance and characteristics of the disposal site.
- (17) "Pyrophoric liquid" means any liquid that ignites spontaneously in dry or moist air at or below 130° F (54.5° C). A pyrophoric solid is any solid material, other than one classed as an explosive, which under normal conditions is liable to cause fires through friction, retained heat from manufacturing or processing or which can be ignited readily and when ignited burns so vigorously and persistently as to create a serious transportation, handling or disposal hazard. Included are spontaneously combustible and water-reactive materials.
- (18) "Site closure and stabilization" means those actions that are taken upon completion of operations that prepare the disposal site for custodial care and that assure that the disposal site will remain stable and will not need ongoing active maintenance.
- (19) "Stability" means structural stability.
- (20) "Surveillance" means observation of the disposal site for purposes of visual detection of need for maintenance, custodial care, evidence of intrusion and compliance with other license and regulatory requirements.

- (21) "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).

Authority: T.C.A. §§ 68-202-101 et seq., 68-202-201 et seq., and 4-5-201 et seq.

~~1200-02-11-.04~~ 0400-20-11-.04 License Required.

- (1) No person may receive, possess and dispose of radioactive waste containing radioactive material at a land disposal facility unless authorized by a license issued by the Department pursuant to this Chapter.
- (2) Each person shall file an application with the Department and obtain a license as provided in this Chapter before commencing construction of a land disposal facility. Failure to comply with this requirement may be grounds for denial of a license.

Authority: T.C.A. §§ 68-202-101 et seq., 68-202-201 et seq., and 4-5-201 et seq.

~~1200-02-11-.05~~ 0400-20-11-.05 Communications.

Except where otherwise specified, all communications and reports concerning the ~~regulations~~ rules in this ~~chapter~~ Chapter and applications filed under them should be addressed to the Division at the address in Rule ~~1200-02-04-.07~~ 0400-20-04-.07.

Authority: T.C.A. §§ 68-202-101 et seq., 68-202-201 et seq., and 4-5-201 et seq.

~~1200-02-11-.06~~ 0400-20-11-.06 Reserved.

Authority: T.C.A. §§ 68-202-101 et seq., 68-202-201 et seq., and 4-5-201 et seq.

~~1200-02-11-.07~~ 0400-20-11-.07 Reserved.

Authority: T.C.A. §§ 68-202-101 et seq., 68-202-201 et seq., and 4-5-201 et seq.

~~1200-02-11-.08~~ 0400-20-11-.08 Content of Application.

- (1) An application to receive from others, possess and dispose of wastes containing or contaminated with radioactive material by land disposal must consist of general information, specific technical information, institutional information, and financial information, as set forth in this Chapter and Chapter ~~1200-02-10~~ 0400-20-10. An environmental report must accompany the application.
- (2) General information must include:
- (a) Identity of the applicant including:
1. The full name, address, telephone number and description of the business or occupation of the applicant;
 2. If the applicant is a partnership, the name and address of each partner and the principal location where the partnership does business;
 3. If the applicant is a corporation or an unincorporated association,
 - (i) the state where it is incorporated or organized and the principal location where it does business, and
 - (ii) the names and addresses of its directors and principal officers; and

4. If the applicant is acting as an agent or representative of another person in filing the application, all information required under this paragraph must be supplied with respect to the other person.
- (b) Qualifications of the applicant:
1. The organizational structure of the applicant, both offsite and onsite, including a description of lines of authority and assignments of responsibilities, whether in the form of administrative directives, contract provisions or otherwise;
 2. The technical qualifications, including training and experience, of the applicant and members of the applicant's staff to engage in the proposed activities. Minimum training and experience requirements for personnel filling key positions described in ~~(b)1. above~~ part 1 of this subparagraph must be provided;
 3. A description of the applicant's personnel training program; and
 4. The plan to maintain an adequate complement of trained personnel to carry out waste receipt, handling, and disposal operations in a safe manner.
- (c) A description of:
1. The location of the proposed disposal site;
 2. The general character of the proposed activities;
 3. The types and quantities of radioactive waste to be received, possessed and disposed of;
 4. Plans for use of the land disposal facility for purposes other than disposal of radioactive wastes; and
 5. The proposed facilities and equipment.
- (d) Proposed schedules for construction, receipt of waste and first emplacement of waste at the proposed land disposal facility.
- (3) Specific technical information.
- (a) The specific technical information must include the following information needed for demonstration that the performance objectives and the applicable technical requirements of this Chapter will be met:
1. A description of the natural and demographic disposal site characteristics as determined by disposal site selection and characterization activities. The description must include geologic, geotechnical, hydrologic, meteorologic, climatologic and biotic features of the disposal site and vicinity.
 2. A description of the design features of the land disposal facility and the disposal units. The description must include those design features related to infiltration of water; integrity of covers for disposal units; structural stability of backfill, wastes and covers; contact of wastes with standing water; disposal site drainage; disposal site closure and stabilization; elimination to the extent practicable of long-term disposal site maintenance; inadvertent intrusion; occupational exposures; disposal site monitoring; and adequacy of the size of the buffer zone for monitoring and potential mitigative measures.
 3. A description of the principal design criteria and their relationship to the performance objectives.

4. A description of the design basis natural events or phenomena and their relationship to the principal design criteria.
 5. A description of codes and standards which the applicant has applied to the design and which will apply to construction of the land disposal facilities.
 6. A description of the construction and operation of the land disposal facility. The description must include as a minimum the methods of construction of disposal units; waste emplacement; the procedures for and areas of waste segregation; types of intruder barriers; onsite traffic and drainage systems; survey control program; methods and area of waste storage; and methods to control surface water and ground water access to the wastes. The description must also include a description of the methods to be employed in the handling and disposal of wastes containing chelating agents or other nonradiological substances that might affect meeting the performance objectives in this Chapter.
 7. A description of the disposal site closure plan, including those design features which are intended to facilitate disposal site closure and to eliminate the need for ongoing active maintenance.
 8. An identification of the known natural resources at the disposal site, the exploitation of which could result in inadvertent intrusion into the low-level wastes after removal of active institutional control.
 9. A description of the kind, amount, classification and specifications of the radioactive material proposed to be received, possessed and disposed of at the land disposal facility.
 10. A description of the quality control program, developed and applied by the applicant to:
 - (i) The determination of the natural characteristics of the disposal site,
 - (ii) The design, construction, operation and closure of the land disposal facility; and the receipt, handling, and emplacement of waste.
 - (iii) Audits and managerial controls must be included.
 11. A description of the radiation safety program for control and monitoring of radioactive effluents to ensure compliance with the performance objectives of this Chapter and occupational radiation exposure to ensure compliance with the requirements of Chapter ~~4200-02-05~~ 0400-20-05 and to control contamination of personnel, vehicles, equipment, buildings and the disposal site. Both routine operations and accidents must be addressed. The program description must include procedures, instrumentation, facilities and equipment.
 12. A description of the environmental monitoring program to provide data to evaluate potential health and environmental impacts and the plan for taking corrective measures if migration of radionuclides is indicated.
 13. A description of the administrative procedures that the applicant will apply to control activities at the land disposal facility.
- (b) The specific technical information must also include the following analyses needed to demonstrate that the performance objectives of this Chapter will be met:
1. Pathways analyzed in demonstrating protection of the general population from releases of radioactivity must include air, soil, groundwater, surface water, plant uptake and exhumation by burrowing animals. The analyses must clearly identify and differentiate between the roles performed by the natural disposal site characteristics and design features in isolating and segregating the wastes. The analyses must clearly demonstrate

that there is reasonable assurance that the exposures to humans from the release of radioactivity will not exceed the limits set forth in this Chapter.

2. Analyses of the protection of individuals from inadvertent intrusion must include demonstration that there is reasonable assurance the waste classification and segregation requirements will be met and that barriers to inadvertent intrusion will be provided.
 3. Analyses of the protection of individuals during operations must include assessments of expected exposures due to routine operations and accidents during handling, storage and disposal of waste. The analyses must provide assurance that exposures will be controlled to meet the requirements of Chapter ~~5~~ 0400-20-05.
 4. Analyses of the long-term stability of the disposal site and the need for ongoing active maintenance after closure must be based upon analyses of active natural processes such as erosion, mass wasting, slope failure, settlement of wastes and backfill, infiltration through covers over disposal areas and adjacent soils, and surface drainage of the disposal site. The analyses must provide assurance that there will not be a need for ongoing active maintenance of the disposal site following closure.
- (4) Institutional information must include:
- (a) A certification by the Federal or State government which owns the disposal site that the Federal or State government is prepared to accept transfer of the license or assume management control if it is the Federal government when the provisions of ~~1200-02-11-.14~~ Rule 0400-20-11-.14 are met, and will assume responsibility for custodial care after site closure and postclosure observation and maintenance.
 - (b) Where the proposed disposal site is on land not owned by the Federal or a State government, the applicant must submit evidence that arrangements have been made for assumption of ownership in fee by the Federal or State government before the Department issues a license.
- (5) Financial information must be submitted to demonstrate that the financial qualifications of the applicant are adequate to carry out the activities for which the license is sought and meet other financial assurance requirements as specified in Chapter ~~1200-02-10~~ 0400-20-10.
- (6) Depending upon the nature of the wastes to be disposed of and the design and proposed operation of the land disposal facility, additional information may be requested by the Department.
- (7) An application for a license under this Chapter and any amendments thereto shall be filed with the Division of Radiological Health, signed by the applicant and must consist of ~~one~~ 1 signed original and ~~two~~ 2 copies.
- (8) Other copies of the application and environmental report must be retained by the applicant for distribution in accordance with written instructions from the Director, Division of Radiological Health.
- (9) The application and environmental report must be as complete as possible based on the information that is available at the time of submittal.
- (10) The applicant shall supplement its application or environmental report in a timely manner, as necessary, to permit the Department to review, prior to issuance of a license, any changes in the activities proposed to be carried out or new information regarding the proposed activities.

Authority: T.C.A. §§ 68-202-101 et seq., 68-202-201 et seq., and 4-5-201 et seq.

~~1200-02-11-.09~~ 0400-20-11-.09 Standards for Issuance.

- (1) A license for the receipt, possession and disposal of waste containing or contaminated with radioactive material will be issued by the Department upon finding that the issuance of the license will not constitute a risk to the health and safety of the public greater than risks from other industries, and:
 - (a) The applicant is qualified by reason of training and experience to carry out the disposal operations requested in a manner that protects health and property.
 - (b) The applicant's proposed disposal site, disposal site design, land disposal facility operations (including equipment, facilities and procedures), disposal site closure and postclosure institutional control protect the public health and safety in that they provide assurance that the general population will be protected from releases of radioactivity as specified in the performance objective in ~~4200-02-11-16~~ paragraph (2) of Rule 0400-20-11-16.
 - (c) The applicant's proposed disposal site, disposal site design, land disposal facility operations (including equipment, facilities and procedures), disposal site closure and postclosure institutional control protect the public health and safety in that they provide assurance that individual inadvertent intruders are protected in accordance with the performance objective in ~~4200-02-11-16~~ paragraph (3) of Rule 0400-20-11-16.
 - (d) The applicant's proposed land disposal operations, including equipment, facilities and procedures, protect the public health and safety in that they will provide assurance that the standards for radiation protection set out in Chapter ~~4200-02-05~~ 0400-20-05 will be met.
 - (e) The applicant's proposed disposal site, disposal site design, land disposal facility operations, disposal site closure and postclosure institutional control protect the public health and safety in that they will provide assurance that long-term stability of the disposed waste and the disposal site will be achieved and will eliminate to the extent practicable the need for ongoing active maintenance of the disposal site following closure.
 - (f) The applicant's demonstration provides assurance that the applicable technical requirements of this Chapter will be met.
 - (g) The applicant's proposal for institutional control provides assurance that institutional control will be provided for the length of time found necessary to ensure the findings in subparagraphs (b) through (e) of ~~4200-02-11-09(1)~~ this paragraph and that the institutional control meets the requirements of ~~4200-02-11-17~~ paragraph (10) of Rule 0400-20-11-17.
 - (h) The information on financial assurance meets the requirements of this Chapter and Chapter ~~4200-02-10~~ 0400-20-10.
 - (i) Any additional information submitted as requested by the Department pursuant to ~~4200-02-11-08~~ paragraph (6) of Rule 0400-20-11-08, is adequate.
- (2) Conditions of licenses.
 - (a) A license issued under this Chapter or any right thereunder, may be transferred, assigned or in any manner disposed of, either voluntarily or involuntarily, directly or indirectly, through transfer of control of the license to any person, only if the Department finds, after securing full information, that the transfer is in accordance with the provisions of Tennessee Code Annotated Title 68 Chapter ~~23~~ 202 and gives its consent in writing in the form of a license amendment.
 - (b) The licensee shall submit written statements under oath upon request of the Department, at any time before termination of the license, to enable the Department to determine whether or not the license should be modified, suspended or revoked.
 - (c) The license will be transferred to the site owner only on the full implementation of the final closure plan as approved by the Department, including postclosure monitoring and maintenance.

- (d) The licensee shall be subject to the provisions of ~~Tennessee Code Annotated T.C.A. §§ 68-202-201 et seq.~~ now or hereafter in effect, and to all rules, regulations, and orders of the Department. The terms and conditions of the license are subject to amendment, revision or modification, by reason of amendments to or by reason of rules, regulations and orders issued in accordance with the terms of ~~Tennessee Code Annotated T.C.A. Title 68, Chapter 23 202.~~
 - (e) Any license may be revoked, suspended or modified in whole or in part for any material false statement in the application or because of conditions revealed by any application or statement of fact or any report, record, or inspection or other means which would warrant the Department to refuse to grant a license to the original application, or for failure to operate the facility in accordance with the terms of the license, or for any violation of, or failure to observe any of the terms and conditions of the Act, or any rule, regulation, license or order of the Department.
 - (f) Each person licensed by the Department pursuant to the regulations in this Chapter shall confine possession and use of materials to the locations and purposes authorized in the license.
 - (g) No radioactive waste may be disposed of until the Department has inspected the land disposal facility and has found it to be in conformance with the description, design and construction described in the application for a license.
 - (h) The Department may incorporate in any license at the time of issuance, or thereafter, additional requirements and conditions with respect to the licensee's receipt, possession and disposal of radioactive material as it deems appropriate or necessary in order to:
 1. Protect health and property;
 2. Require reports and the keeping of records and to provide for inspections of activities under the license that may be necessary or appropriate to effectuate the purposes of the Act and regulations thereunder.
 - (i) The authority to dispose of wastes expires on the date stated in the license except as provided in ~~4200-02-11-11 paragraph (1) of Rule 0400-20-11-11.~~
- (3) Changes.
- (a) Except as provided for in specific license conditions, the licensee shall not make changes in the land disposal facility or procedures described in the license application. The license will include conditions restricting subsequent changes to the facility and the procedures authorized which are important to public health and safety. These license restrictions will fall into categories of descending importance to public health and safety as follows:
 1. Those features and procedures which may not be changed without ~~sixty~~ 60 days prior notice to the Department and prior Department approval; and
 2. Those features and procedures which may not be changed without 60 days prior notice to the Department. Features and procedures falling in this category may not be changed without prior Department approval if the Department, after having received the required notice, so orders.
 - (b) Changes in procedures contained in requests for amendments to authorize site closure, license transfer or license termination shall be included in ~~(a)1-above part (a)1 of this paragraph.~~

Authority: T.C.A. §§ 68-202-101 et seq., 68-202-201 et seq., and 4-5-201 et seq.

~~4200-02-11-10~~ 0400-20-11-10 Amendment or Renewal.

- (1) An application for amendment of a license may be filed in accordance with ~~4200-02-11-08 paragraphs (7) and (8) of Rule 0400-20-11-08~~ and shall fully describe the requested license amendment.

- (2) In determining whether an amendment to a license will be approved, the Department will apply the criteria set forth in ~~4200-02-11-09~~ paragraph (1) of Rule 0400-20-11-09.

Authority: T.C.A. §§ 68-202-101 et seq., 68-202-201 et seq., and 4-5-201 et seq.

~~4200-02-11-14~~ 0400-20-11-11 Application for Renewal or Closure.

- (1) Any expiration date on a license applies only to the authority to dispose of waste. Failure to renew the license shall not relieve the licensee of responsibility for carrying out site closure, postclosure monitoring and transfer of the license to the site owner. An application for renewal or an application for closure under ~~4200-02-11-12~~ Rule 0400-20-11-12 must be filed at least 30 days prior to license expiration.
- (2) Applications for renewal of a license must be filed in accordance with ~~4200-02-11-08~~ Rule 0400-20-11-08. Applications for closure must be filed in accordance with ~~4200-02-11-08~~ paragraph (7) and (8) of Rule 0400-20-11-08 and ~~4200-02-11-12~~ Rule 0400-20-11-12. Unless requested otherwise, information contained in previous applications, statements or reports filed with the Department under the license may be incorporated by reference if the references are clear and specific.
- (3) In any case in which a licensee has timely filed an application for renewal of a license, the license for continued receipt and disposal of licensed materials does not expire until the Department has taken final action on the application for renewal.
- (4) In determining whether a license will be renewed, the Department will apply the criteria set forth in ~~4200-02-11-09~~ paragraph (1) of Rule 0400-20-11-09.

Authority: T.C.A. §§ 68-202-101 et seq., 68-202-201 et seq., and 4-5-201 et seq.

~~4200-02-11-12~~ 0400-20-11-12 Contents of Application for Closure.

- (1) Prior to final closure of the disposal site, or as otherwise directed by the Department, the applicant shall submit an application to amend the license for closure. This closure application must include a final revision and specific details of the disposal site closure plan included as part of the license application submitted under ~~4200-02-11-08~~ part (3)(a)7 of Rule 0400-20-11-08 that includes each of the following:
- (a) Any additional geologic, hydrologic or other disposal site data pertinent to the long-term containment of emplaced radioactive wastes obtained during the operation period.
- (b) The results of tests, experiments or other analyses relating to backfill of excavated areas, closure and sealing, waste migration and interaction with emplacement media, or any other tests, experiments or analysis pertinent to the long-term containment of emplaced waste within the disposal site.
- (c) Any proposed revision of plans for:
1. Decontamination and/or dismantlement of surface operational facilities;
 2. Backfilling of excavated areas; or
 3. Stabilization of the disposal site for postclosure care.
- (d) Any significant new information regarding the environmental impact of closure activities and long-term performance of the disposal site.
- (2) Upon review and consideration of an application to amend the license for closure submitted in accordance with paragraph (1) of this rule, the Department shall issue an amendment authorizing closure if there is assurance that the long-term performance objectives of ~~4200-02-11-16~~ Rule 0400-20-11-16 will be met.

Authority: T.C.A. §§ 68-202-101 et seq., 68-202-201 et seq., and 4-5-201 et seq.

~~4200-02-11-.13~~ 0400-20-11-.13 Post Closure Observation and Maintenance.

Following completion of closure authorized in ~~4200-02-11-.12~~ Rule 0400-20-11-.12 the licensee shall observe, monitor and carry out necessary maintenance and repairs at the disposal site until the license is transferred by the Department in accordance with ~~4200-02-11-.14~~ Rule 0400-20-11-.14. Responsibility for the disposal site must be maintained by the licensee for 5 years. A shorter or ~~longer~~ longer time period for post-closure observation and maintenance may be established and approved as part of the site closure plan, based on site-specific conditions.

Authority: T.C.A. §§ 68-202-101 et seq., 68-202-201 et seq., and 4-5-201 et seq.

~~4200-02-11-.14~~ 0400-20-11-.14 Transfer of License.

- (1) Following closure and the period of post-closure observation and maintenance, the licensee may apply for an amendment to transfer the license to the disposal site owner. The license shall be transferred when the Department finds:
 - (a) That the closure of the disposal site has been made in conformance with the licensee's disposal site closure plan, as amended and approved as part of the license;
 - (b) That assurance has been provided by the licensee that the performance objectives of ~~4200-02-11-.16~~ Rule 0400-20-11-.16 are met;
 - (c) That any funds and necessary records for care, required by ~~Rules 4200-02-11-.19~~ subparagraphs (1)(e) and (f) of Rule 0400-20-11-.19, will be transferred to the disposal site owner;
 - (d) That the post-closure monitoring program is operational for implementation by the disposal site owner; and
 - (e) That the Federal or State government agency which will assume responsibility for institutional control of the disposal site is prepared to assume responsibility ~~and~~ and ensure that the institutional requirements found necessary under ~~4200-02-11-.09~~ Rule 0400-20-11-.09 will be met.

- (2) Reserved

Authority: T.C.A. §§ 68-202-101 et seq., 68-202-201 et seq., and 4-5-201 et seq.

~~4200-2-11-.15~~ 0400-20-11-.15 Termination of License.

- (1) Following any period of institutional control needed to meet the requirements found necessary under ~~4200-02-11-.09~~ Rule 0400-20-11-.09, the licensee may apply for an amendment to terminate the license.
- (2) This application must be filed, and will be reviewed, in accordance with the ~~provision~~ provisions of ~~4200-02-11-.08~~ paragraphs (7) and (8) of Rule 0400-20-11-.08.
- (3) A license is terminated only when the Department finds:
 - (a) That the institutional control requirements found necessary under ~~4200-02-11-.09~~ subparagraph (1)(g) of Rule 0400-20-11-.09 have been met; ~~and~~
 - (b) That any additional requirements resulting from new information developed during the institutional control period have been met, and that permanent monuments or markers warning against intrusion have been installed; ~~and~~
 - (c) That the records required by ~~4200-02-11-.19~~ subparagraphs (1)(e) and (f) of Rule 0400-20-11-.19 have been sent to the party responsible for institutional control of the disposal site and a copy has been sent to the Division immediately prior to license termination.

Authority: T.C.A. §§ 68-202-101 et seq., 68-202-201 et seq., and 4-5-201 et seq.

~~1200-02-11-.16~~ 0400-20-11-.16 Performance Objectives.

(1) General requirement.

Land disposal facilities must be sited, designed, operated, closed and controlled after closure so that reasonable assurance exists that exposures to humans are within the limits established in the performance objectives in paragraphs (2) through (5) of this rule.

(2) Protection of the general population from releases of radioactivity.

Concentrations of radioactive material which may be released to the general environment in ground water, surface water, air, soil, plants or animals must not result in an annual dose exceeding an equivalent of 25 millirems to the whole body, 75 millirems to the thyroid and 25 millirems to any other organ of any member of the public. Reasonable effort shall be made to maintain releases of radioactivity in effluents to the general environment as low as is reasonably achievable.

(3) Protection of individuals from inadvertent intrusion.

Design, operation and closure of the land disposal facility must ensure protection of any individual inadvertently intruding into the disposal site and occupying the site or contacting the waste at any time after active institutional controls over the disposal site are removed.

(4) Protection of individuals during operations.

Operations at the land disposal facility must be conducted in compliance with the standards for radiation protection set out in Chapter ~~§ 0400-20-05~~, except for releases of radioactivity in effluents from the land disposal facility, which shall be governed by paragraph (2) of this rule. Every reasonable effort shall be made to maintain radiation exposures as low as is reasonably achievable.

(5) Stability of the disposal site after closure.

The disposal facility must be sited, designed, used, operated and closed to achieve long-term stability of the disposal site and to eliminate to the extent practicable the need for ongoing active maintenance of the disposal site following closure so that only surveillance, monitoring or minor custodial care are required.

Authority: T.C.A. §§ 68-202-101 et seq., 68-202-201 et seq., and 4-5-201 et seq.

~~1200-02-11-.17~~ 0400-20-11-.17 Technical Requirements for Land Disposal Facilities.

(1) Disposal site suitability requirements for land disposal.

(a) The purpose of this ~~section~~ paragraph is to specify the minimum characteristics a disposal site must have to be acceptable for use as a disposal facility. The primary emphasis in disposal site suitability is given to isolation of wastes, a matter having long-term impacts and to disposal site features that ensure that the long-term performance objectives of ~~1200-02-11-.16~~ of this part Rule 0400-20-11-.16 are met, as opposed to short-term convenience or benefits.

(b) The disposal site shall be capable of being characterized, modeled, analyzed and monitored.

(c) Within the region where the facility is to be located, a disposal site should be selected so that projected population growth and future developments are not likely to affect the ability of the disposal facility to meet the performance objective of ~~1200-02-11-.16~~ Rule 0400-20-11-.16.

(d) Areas must be avoided having known natural resources which, if exploited, would result in failure to meet the performance objectives of ~~1200-02-11-.16~~ Rule 0400-20-11-.16.

- (e) The disposal site must be generally well drained and free of areas of flooding or frequent ponding. Waste disposal shall not take place in a 100-year flood plain or wetland, as defined in Presidential ~~executive~~ Executive Order 11988, "Floodplain Management Guidelines."
 - (f) Upstream drainage areas must be minimized to decrease the amount of runoff which could erode or inundate waste disposal units.
 - (g) The disposal site must provide sufficient depth to the watertable that ground water intrusion, perennial or otherwise, onto waste will not occur. The Department will consider an exception to this requirement to allow disposal below the watertable if it can be conclusively shown that disposal site characteristics will result in molecular diffusion being the predominant means of radionuclide movement and the rate of movement will result in the performance objectives of ~~4200-02-11-.16~~ Rule 0400-20-11-.16 being met. In no case will waste disposal be permitted in the zone of fluctuation of the water table.
 - (h) The hydrogeologic unit used for disposal shall not discharge ground water to the surface within the disposal site.
 - (i) Areas must be avoided where tectonic processes such as faulting, folding, seismic activity or vulcanism may occur with such frequency and extent to affect the ability of the disposal site to meet the performance objectives of ~~4200-02-11-.16~~ Rule 0400-20-11-.16, or may preclude defensible modeling and prediction of long-term impacts.
 - (j) Areas must be avoided where surface geologic processes such as mass wasting, erosion, slumping, landsliding or weathering occur with such frequency and extent to affect the ability of the disposal site to meet the performance objectives of ~~4200-02-11-.16~~ Rule 0400-20-11-.16, or may preclude defensible modeling and prediction of long-term impacts.
 - (k) The disposal site must not be located where nearby facilities or activities could impact the ability of the site to meet the performance objectives of ~~4200-02-11-.16~~ Rule 0400-20-11-.16 or mask the environmental monitoring program.
- (2) Disposal site design for land disposal.
- (a) Site design features must be directed toward long-term isolation and avoidance of the need for continuing active maintenance after site closure.
 - (b) The disposal site design and operation must be compatible with the disposal site closure and stabilization plan and lead to disposal site closure that provides assurance that the performance objectives of ~~4200-02-11-.16~~ Rule 0400-20-11-.16 will be met.
 - (c) The disposal site must be designed to complement and improve, where appropriate, the ability of the disposal site's natural characteristics to assure that the performance objectives of ~~4200-02-11-.16~~ Rule 0400-20-11-.16 will be met.
 - (d) Covers must be designed to minimize to the extent practicable water infiltration, to direct percolating or surface water away from the disposed waste and to resist degradation by surface geologic processes and biotic activity.
 - (e) Surface features must direct surface water drainage away from disposal units at velocities and gradients which will not result in erosion that will require ongoing active maintenance in the future.
 - (f) The disposal site must be designed to minimize to the extent practicable the contact of water with waste during storage, the contact of standing water with waste during disposal and the contact of percolating or standing water with wastes after disposal.
- (3) Land disposal facility operation and disposal site closure.

- (a) Wastes designated as Class A pursuant to paragraph (6) of this rule must be segregated from other wastes by placing in disposal units which are sufficiently separated from disposal units for the other waste classes so that any interaction between Class A wastes and other wastes will not result in the failure to meet the performance objectives in ~~4200-02-11-16~~ Rule 0400-20-11-16. This segregation is not necessary for Class A wastes if they meet the stability requirements in subparagraph (7)(b) of this rule.
 - (b) Wastes designated as Class C pursuant to paragraph (6) of this rule must be disposed of so that the top of the waste is a minimum of 5 meters below the top surface of the cover or must be disposed of with intruder barriers that are designed to protect against an inadvertent intrusion for at least 500 years.
 - (c) All wastes shall be disposed of in accordance with the requirements of subparagraphs (d) through (k) below of this paragraph.
 - (d) Wastes must be emplaced in a manner that maintains the package integrity during emplacement, minimizes the void spaces between packages and permits the void spaces to be filled.
 - (e) Void spaces between waste packages must be filled with earth or other material to reduce future subsidence within the disposal unit.
 - (f) Waste must be placed and covered in a manner that limits the radiation dose rate at the surface of the cover to levels that at a minimum will permit the licensee to comply with all provisions of ~~4200-02-05-60~~ Rule 0400-20-11-60 at the time the license is transferred pursuant to ~~4200-02-11-14~~ Rule 0400-20-11-14.
 - (g) The boundaries and locations of each disposal unit must be accurately located and mapped by means of a land survey. Disposal units must be marked in such a way that the boundaries of each unit can be easily defined. Three permanent survey marker control points, referenced to United States Geological Survey (USGS) or National Geodetic Survey (NGS) survey control stations, must be established on the site to facilitate surveys. The USGS or NGS control stations must provide horizontal and vertical controls as checked against USGS or NGS record files.
 - (h) A buffer zone of land must be maintained between any disposal unit and the disposal boundary and beneath the disposed waste. The buffer zone shall be of adequate dimensions to carry out environmental monitoring activities specified in paragraph (4) of this rule and take mitigative measures if needed.
 - (i) Closure and stabilization measures as set forth in the approved site closure plan must be carried out as each disposal unit is filled and covered.
 - (j) Active waste disposal operations must not have an adverse effect on completed closure and stabilization measures.
 - (k) Only wastes containing or contaminated with radioactive materials shall be disposed of at the disposal site.
- (4) Environmental monitoring.
- (a) At the time a license application is submitted, the applicant shall have conducted a pre-operational monitoring program to provide basic environmental data on the disposal site characteristics. The applicant shall obtain information about the ecology, metrology, climate, hydrology, geology, geochemistry and seismology of the disposal site. For those characteristics that are subject to seasonal variation, data must cover at least a ~~twelve~~ 12 month period.
 - (b) The licensee must have plans for taking corrective measures if migration of radionuclides would indicate that the performance objectives of ~~4200-02-11-16~~ Rule 0400-20-11-16 may not be met.

- (c) During the land disposal facility site construction and operation, the licensee shall maintain a monitoring program, including a monitoring system. Measurements and observations must be made and recorded to provide data to evaluate the potential health and environmental impacts during both the construction and the operation of the facility and to enable the evaluation of long-term effects and the need for mitigative measures. The monitoring system must be capable of providing early warning of releases of radionuclides from the disposal unit before they leave the site boundary.
- (d) After the disposal site is closed, the licensee responsible for post-operational surveillance of the disposal site shall maintain a monitoring system based on the operating history and the closure and stabilization of the disposal site. The monitoring system must be capable of providing early warning of releases of radionuclides from the disposal unit before they leave the site boundary.

(5) Alternative requirements for design and operations.

The Department may, upon request or on its own initiative, authorize provisions other than those set forth in paragraphs (2), (3) and (4) of this rule for the segregation and disposal of waste and for the design and operation of a land disposal facility on a specific basis, if it finds assurance of compliance with the performance objectives of ~~4200-02-11-16~~ Rule 0400-20-11-16.

(6) Waste Classification.

(a) Determination of the classification of radioactive waste involves two considerations. First, consideration must be given to the concentration of long-lived radionuclides (and their short-lived precursors) whose potential hazard will persist long after such precautions as institutional controls, improved waste form and deeper disposal have ceased to be effective. These precautions delay the time when long-lived radionuclides could cause exposures. In addition, the magnitude of the potential dose is limited by the concentration and availability of the radionuclide at the time of exposure. Second, consideration must be given to the concentration of shorter-lived radionuclides for which requirements on institutional controls, waste form and disposal methods are effective.

(b) Classes of waste.

1. Class A waste is waste that is usually segregated from other waste classes at the disposal site. The physical form and characteristics of Class A waste must meet the minimum requirements set forth in subparagraph (7)(a) of this rule. If Class A waste also meets the stability requirements set forth in subparagraph (7)(b) of this rule, it is not necessary to segregate the waste for disposal.
2. Class B waste is waste that must meet more rigorous requirements on waste form to ensure stability after disposal. The physical form and characteristics of Class B waste must meet both the minimum and stability requirements set forth in paragraph (7) of this rule.
3. Class C waste is waste that not only must meet more rigorous requirements on waste form to ensure stability but also requires additional measures at the disposal facility to protect against inadvertent intrusion. The physical form and characteristics of Class C waste must meet both the minimum and stability requirements set forth in paragraph (7) of this rule.
4. Waste that is not acceptable for disposal is waste for which waste form and disposal methods must be different and, in general, more stringent than those specified for Class C waste. In the absence of specific requirements in this Chapter, proposals for disposal of this waste may be submitted to the Department for approval, pursuant to paragraph (9) of this rule.

(c) If radioactive waste contains only radionuclides listed in Table 1, classification shall be determined as follows:

1. If the concentration does not exceed 0.1 times the value in Table 1, the waste is Class A.
2. If the concentration exceeds 0.1 times the value in Table 1 but does not exceed the value in Table 1, the waste is Class C.
3. If the concentration exceeds the value in Table 1, the waste is not acceptable for disposal, except under ~~(e)~~ part (b)4 of this ~~rule~~ paragraph.
4. For wastes containing mixtures of radionuclides listed in Table 1, the total concentration shall be determined by the sum of fractions rule described in ~~(e)~~ subparagraph (g) of this ~~rule~~ paragraph.

Table 1

Radionuclide	Concentration curies per cubic meter
C-14	8
C-14 in activated metal	80
Ni-59 in activated metal	220
Nb-94 in activated metal	0.2
Tc-99	3
I-129	0.08
Alpha emitting transuranic nuclides with half-life greater than five (5) years	100 ¹
Pu-241	3,500 ¹
Cm-242	20,000 ¹

¹ Units are nanocuries per gram.

- (d) If radioactive waste does not contain any of the radionuclides listed in Table 1, classification shall be determined based on the concentrations shown in Table 2. However, as specified in subparagraph (f) of this paragraph, if radioactive waste does not contain any nuclides listed in either Table 1 or 2, it is Class A.
1. If the concentration does not exceed the value in Column 1, the waste is Class A.
 2. If the concentration exceeds the value in Column 1, but does not exceed the value in Column 2, the waste is Class B.
 3. If the concentration exceeds the value in Column 2, but does not exceed the value in Column 3, the waste is Class C.
 4. If the concentration exceeds the value in Column 3, the waste is not acceptable for disposal, except under ~~(e)~~ part (b)4 of this ~~rule~~ paragraph.
 5. For wastes containing mixtures of the nuclides listed in Table 2, the total concentration shall be determined by the sum of fractions rule described in subparagraph (g) of this paragraph.

Table 2

Concentration, curies
per cubic meter

Radionuclide	Col. 1	Col. 2	Col. 3
Total of all nuclides with less than 5 year half life	700	(¹)	(¹)
H-3	40	(¹)	(¹)
Co-60	700	(¹)	(¹)
Ni-63	3.5	70	700
Ni-63 in activated metal	35	700	7000
Sr-90	0.04	150	7000
Cs-137	1	44	4600

¹ There are no limits established for these radionuclides in Class B or C wastes. Practical considerations such as the effects of external radiation and internal heat generation on transportation, handling and disposal will limit the concentrations for these wastes. These wastes shall be Class B unless the concentrations of other nuclides in Table 2 determine the waste to be Class C independent of these nuclides.

- (e) If radioactive waste contains a mixture of radionuclides, some of which are listed in Table 1 and some of which are listed in Table 2, classification shall be determined as follows:
1. If the concentration of a nuclide listed in Table 1 does not exceed 0.1 times the value listed in Table 1, the class shall be that determined by the concentration of nuclides listed in Table 2.
 2. If the concentration of a nuclide listed in Table 1 exceeds 0.1 times the value listed in Table 1 but does not exceed the value in Table 1, the waste shall be Class C, provided the concentration of nuclides listed in Table 2 does not exceed the value shown in Column 3 of Table 2.
- (f) If radioactive waste does not contain any nuclides listed in either Table 1 or 2, it is Class A.
- (g) For determining classification for waste that contains a mixture of radionuclides, it is necessary to determine the sum of fractions by dividing each nuclide's concentration by the appropriate limit and adding the resulting values. The appropriate limits must all be taken from the same column of the same table. The sum of the fractions for the column must be less than 1.0 if the waste class is to be determined by that column. Example: a waste contains Sr-90 in a concentration of 50 Ci/m³ and Cs-137 in a concentration of 22 Ci/m³. Since the concentrations both exceed the values in Column 1, Table 2, they must be compared to Column 2 values. For Sr-90 fraction, $50/150 = 0.33$; for Cs-137 fraction, $22/44 = 0.5$; the sum of the fractions = 0.83. Since the sum is less than 1.0, the waste is Class B.
- (h) The concentration of a radionuclide may be determined by indirect methods such as use of scaling factors which relate the inferred concentration of one radionuclide to another that is measured, or radionuclide material accountability, if there is assurance that the indirect methods can be correlated with actual measurements. The concentration of a radionuclide may be averaged over the volume of the waste, or weight of the waste if the units are expressed as nanocuries per gram.
- (7) Waste characteristics.
- (a) The following requirements are minimum requirements for all classes of waste and are intended to facilitate handling at the disposal site and provide protection of health and safety of personnel at the disposal site.
1. Waste must not be packaged for disposal in cardboard or fiberboard boxes.
 2. Liquid waste must be solidified or packaged in sufficient absorbent material to absorb twice the volume of the liquid.

3. Solid waste containing liquid shall contain as little free standing and noncorrosive liquid as is reasonably achievable, but in no case shall the liquid exceed one percent of the volume.
4. Waste must not be capable of detonation or of explosive decomposition or reaction at normal pressures and temperatures or of explosive reaction with water.
5. Waste must not contain, or be capable of generating, quantities of toxic gases, vapors or fumes harmful to persons transporting, handling or disposing of the waste. This does not apply to radioactive gaseous waste packaged in accordance with part (a)7 of this paragraph.
6. Waste must not be pyrophoric. Pyrophoric materials contained in waste shall be treated, prepared and packaged to be nonflammable.
7. Waste in a gaseous form must be packaged at a pressure that does not exceed 1.5 atmospheres at 20° C. Total activity must not exceed 100 curies per container.
8. Waste containing hazardous, biological, pathogenic or infectious material must be treated to reduce to the maximum extent practicable the potential hazard from the non-radiological materials.

(b) The requirements in this paragraph are intended to provide stability of the waste. Stability is intended to ensure that the waste does not structurally degrade and affect overall stability of the site through slumping, collapse or other failure of the disposal unit and thereby lead to water infiltration. Stability is also a factor in limiting exposure to an inadvertent intruder, since it provides a recognizable and nondispersible waste.

1. Waste must have structural stability. A structurally stable waste form will maintain its physical dimensions and its form, under the expected disposal conditions such as weight of overburden and compaction equipment, the presence of moisture, and microbial activity and internal factors such as radiation effects and chemical changes. Structural stability can be provided by the waste form itself, processing the waste to a stable form or placing the waste in a disposal container or structure that provides stability after disposal.
2. Notwithstanding the provisions in ~~4200-02-11-17(7)~~ parts (a)2 and 3 of this paragraph, liquid wastes, or wastes containing liquid, must be converted into a form that contains as little free standing and noncorrosive liquid as is reasonably achievable, but in no case shall the liquid exceed one percent of the volume of the waste when the waste is in a disposal container designed to ensure stability, or one-half (0.5) percent of the volume of the waste for waste processed to a stable form.
3. Void spaces within the waste and between the waste and its package must be reduced to the extent practicable.

(8) Labeling.

Each package of waste must be clearly labeled to identify whether it is Class A waste, Class B waste or Class C waste in accordance with paragraph (6) of this rule.

(9) Alternative requirements for waste classification characteristics.

The Department may, upon request or on its own initiative, authorize other provisions for the classification and characteristics of waste on a specific basis, if, after evaluation of the specific characteristics of the waste, disposal site and method of disposal, it finds assurance of compliance with the performance objectives in ~~4200-02-11-16~~ Rule 0400-20-11-16.

(10) Institutional requirements.

- (a) Disposal of radioactive waste received from other persons may be permitted only on land owned in fee by the Federal or State government.
- (b) The land owner or custodial agency shall carry out an institutional control program to physically control access to the disposal site following transfer of control of the disposal site from the disposal site operator. The institutional control program must also include, but not be limited to, carrying out an environmental monitoring program at the disposal site, periodic surveillance, minor custodial care, and other requirements as determined by the Department; and administration of funds to cover the costs for these activities. The period of institutional controls will be determined by the Department, but institutional controls may not be relied upon for more than 100 years following transfer of control of the disposal site to the owner.

Authority: T.C.A. §§ 68-202-101 et seq., 68-202-201 et seq., and 4-5-201 et seq.

~~4200-02-11-.18~~ 0400-20-11-.18 Financial Assurance.

Each applicant shall provide for financial assurance in accordance with ~~4200-02-10-.12~~ paragraphs (4) and (5) of Rule 0400-20-10-.12 and this Chapter.

Authority: T.C.A. §§ 68-202-101 et seq., 68-202-201 et seq., and 4-5-201 et seq.

~~4200-02-11-.19~~ 0400-20-11-.19 Records, Reports, Tests and Inspections.

- (1) Maintenance of records, reports and transfers.
 - (a) Each licensee shall maintain any records and make any reports in connection with the licensed activities as may be required by the conditions of the license or by the rules, regulations, and orders of the Department.
 - (b) Records which are required by the regulations or by license conditions must be maintained for a period specified by the appropriate regulations or by license condition. If a retention period is not otherwise specified, these records must be maintained and transferred to the officials specified in subparagraph (e) of this paragraph as a condition of license termination unless the Department otherwise authorizes their disposition.
 - (c) Records which must be maintained may be the original or a reproduced copy or microfilm if this reproduced copy or microfilm is capable of producing copy that is clear and legible at the end of the required retention period.
 - (d) If there is a conflict between the Department regulations, license condition, or other written Department approval or authorization pertaining to the retention period of the same type of record, the longest retention period specified takes precedence.
 - (e) Notwithstanding subparagraphs (a) through (d) of this paragraph, copies of records of the location and the quantity of radioactive wastes contained in the disposal site must be transferred upon license termination to the chief executive of the nearest municipality, the chief executive of the county in which the facility is located, the county zoning board or land development and planning agency, the State governor and other State and local governmental agencies as designated by the Department at the time of license termination.
 - (f) Following receipt and acceptance of a shipment of radioactive waste, the licensee shall record the date of disposal of the waste, the location in the disposal site, the condition of the waste packages as received, any discrepancies between materials listed on the manifest and those received, and any evidence of leaking or damaged packages or radiation or contamination levels in excess of limits specified in U.S. Department of Transportation and Department regulations. The licensee shall briefly describe any repackaging operations of any of the waste packages included in the shipment, plus any other information required by the Department as a license condition.

- (g) Each licensee authorized to dispose of radioactive waste received from other persons shall file a copy of its financial report or a certified financial statement annually with the Department in order to update the information base for determining financial assurances.
- (h) Reports shall be submitted by the end of the first calendar quarter of each year for the preceding year. The reports shall include:
 1. Specification of the quantity of each of the principal radionuclides released to unrestricted areas in liquid and in airborne effluents during the preceding year;
 2. The results of the environmental monitoring program;
 3. A summary of licensee disposal unit survey and maintenance activities;
 4. A summary, by waste class, of activities and quantities of radionuclides disposed of;
 5. Any instances in which observed site characteristics were significantly different from those described in the application for a license; and
 6. Any other information the Department may require.

If the quantities of radioactive materials released during the reporting period, monitoring results or maintenance performed are significantly different from those expected in the materials previously reviewed as part of the licensing action, the report must cover this specifically.

- (i) Any transfer of radioactive materials by the licensee is subject to the requirements in these ~~regulations~~ rules.

(2) Tests at land disposal facilities.

- (a) Each licensee shall perform, or permit the Department to perform if the Department requests, any tests as the Department deems appropriate or necessary for the administration of these regulations, including tests of:
 1. Radioactive wastes and facilities used for the receipt, storage, treatment, handling and disposal of radioactive wastes,
 2. Radiation detection and monitoring instruments; and
 3. Other equipment and devices used in connection with the receipt, possession, handling, treatment, storage or disposal of radioactive waste.

- (b) Reserved.

(3) Inspections of land disposal facilities.

- (a) Each licensee shall afford to the Department at all reasonable times opportunity to inspect radioactive waste not yet disposed of, and the premises, equipment, operations and facilities in which radioactive wastes are received, possessed, handled, treated, stored or disposed of.
- (b) Each licensee shall make available to the Department for inspection, upon reasonable notice, records kept by it pursuant to these ~~regulations~~ rules. Authorized representatives of the Department may copy and take away copies of, for the Department's use, any record kept pursuant to achieving compliance with these ~~regulations~~ rules.

Authority: T.C.A. §§ 68-202-101 et seq., 68-202-201 et seq., and 4-5-201 et seq.

G.O.C. STAFF RULE ABSTRACT

DEPARTMENT: Environment and Conservation
DIVISION: Radiological Health
SUBJECT: Rule Reorganization
STATUTORY AUTHORITY: Tennessee Code Annotated, Section 68-202-101 et seq.
EFFECTIVE DATES: May 22, 2012 through June 30, 2013
FISCAL IMPACT: Minimal
STAFF RULE ABSTRACT:

These rulemaking changes reflect a reorganization of all TDEC rules in order to be more logical and user friendly. This rulemaking affects Chapters 1200-02-04, 1200-02-05, 1200-02-06, 1200-02-07, 1200-02-08, 1200-02-09, 1200-02-10, 1200-02-11 and 1200-02-12. Its various additions and modifications will incorporate:

- a. Changes to the numbering designation of Radiological Health rules from 1200-02 to 0400-20;
- b. Correcting typographical errors throughout all Chapters; and
- c. Deleting obsolete language.

REDLINE

Department of State
Division of Publications

312 Rosa L. Parks Avenue, 8th Floor Snodgrass/TN Tower
Nashville, TN 37243
Phone: 615-741-2650
Fax: 615-741-5133
Email: register.information@tn.gov

For Department of State Use Only

Sequence Number: 02-14-12
Rule ID(s): 5153-5154
File Date: 02/22/2012
Effective Date: 05/22/2012

Rulemaking Hearing Rule(s) Filing Form

Rulemaking Hearing Rules are rules filed after and as a result of a rulemaking hearing. TCA Section 4-5-205

Agency/Board/Commission:	Environment and Conservation
Division:	Radiological Health
Contact Person:	Beth Murphy
Address:	3 rd Floor L&C Annex 401 Church Street Nashville, Tennessee
Zip:	37243-1532
Phone:	(615) 532-0392
Email:	beth.murphy@tn.gov

Revision Type (check all that apply):

- Amendment
- New
- Repeal

Rule(s) Revised (ALL chapters and rules contained in filing must be listed here. If needed, copy and paste additional tables to accommodate multiple chapters. Please enter only **ONE** Rule Number/Rule Title per row)

Chapter Number	Chapter Title
0400-20-12	Radiation Safety Requirements for Well Logging
Rule Number	Rule Title
0400-20-12-.01	Purpose
0400-20-12-.02	Scope
0400-20-12-.03	Definitions
0400-20-12-.04	Registration or Application for a License
0400-20-12-.05	Registration and License for Well Logging
0400-20-12-.06	Agreement with Well Owner or Operator
0400-20-12-.07	Labels, Security, and Transportation Precautions
0400-20-12-.08	Radiation Detection Instruments
0400-20-12-.09	Leak Testing of Sealed Sources
0400-20-12-.10	Physical Inventory
0400-20-12-.11	Records of Material Use
0400-20-12-.12	Design and Performance Criteria for Sealed Sources
0400-20-12-.13	Inspection, Maintenance, and Opening of Sources of Radiation
0400-20-12-.14	Subsurface Tracer Studies
0400-20-12-.15	Radioactive Markers
0400-20-12-.16	Uranium Sinkers Bars
0400-20-12-.17	Use of a Sealed Source in a Well without a Surface Casing
0400-20-12-.18	Training
0400-20-12-.19	Operating and Emergency Procedures
0400-20-12-.20	Personnel Monitoring
0400-20-12-.21	Radiation Surveys

0400-20-12-.22	Radioactive Contamination Control
0400-20-12-.23	Security
0400-20-12-.24	Documents and Records Required at Field Stations
0400-20-12-.25	Documents and Records Required at Temporary Job-sites
0400-20-12-.26	Notification of Incidents and Lost Sources; Abandonment Procedures for Irretrievable Sources
0400-20-12-.27	Energy Compensation Source
0400-20-12-.28	Tritium Neutron Generator Target Source

Chapter Number	Chapter Title
1200-02-12	Radiation Safety Requirements for Well Logging
Rule Number	Rule Title
1200-02-12-.01	Purpose
1200-02-12-.02	Scope
1200-02-12-.03	Definitions
1200-02-12-.04	Registration or Application for a License
1200-02-12-.05	Registration and License for Well Logging
1200-02-12-.06	Agreement with Well Owner or Operator
1200-02-12-.07	Labels, Security, and Transportation Precautions
1200-02-12-.08	Radiation Detection Instruments
1200-02-12-.09	Leak Testing of Sealed Sources
1200-02-12-.10	Physical Inventory
1200-02-12-.11	Records of Material Use
1200-02-12-.12	Design and Performance Criteria for Sealed Sources
1200-02-12-.13	Inspection, Maintenance, and Opening of Sources of Radiation
1200-02-12-.14	Subsurface Tracer Studies
1200-02-12-.15	Radioactive Markers
1200-02-12-.16	Uranium Sinker Bars
1200-02-12-.17	Use of a Sealed Source in a Well without a Surface Casing
1200-02-12-.18	Training
1200-02-12-.19	Operating and Emergency Procedures
1200-02-12-.20	Personnel Monitoring
1200-02-12-.21	Radiation Surveys
1200-02-12-.22	Radioactive Contamination Control
1200-02-12-.23	Security
1200-02-12-.24	Documents and Records Required at Field Stations
1200-02-12-.25	Documents and Records Required at Temporary Job-sites
1200-02-12-.26	Notification of Incidents and Lost Sources; Abandonment Procedures for Irretrievable Sources
1200-02-12-.27	Energy Compensation Source
1200-02-12-.28	Tritium Neutron Generator Target Source

(Place substance of rules and other info here. Statutory authority must be given for each rule change. For information on formatting rules go to <http://tn.gov/sos/rules/1360/1360.htm>)

Repeal

Chapter 1200-02-12 Radiation Safety Requirements for Well Logging is repealed.

Authority: T.C.A. §§ 68-202-101 et seq., 68-202-201 et seq., and 4-5-201 et seq.

New Rules

Chapter 0400-20-12 Radiation Safety Requirements for Well Logging

Table of Contents

0400-20-12-.01	Purpose	0400-20-12-.15	Radioactive Markers
0400-20-12-.02	Scope	0400-20-12-.16	Uranium Sinker Bars
0400-20-12-.03	Definitions	0400-20-12-.17	Use of a Sealed Source in a Well without a Surface Casing
0400-20-12-.04	Registration or Application for a License	0400-20-12-.18	Training
0400-20-12-.05	Registration and License for Well Logging	0400-20-12-.19	Operating and Emergency Procedures
0400-20-12-.06	Agreement with Well Owner or Operator	0400-20-12-.20	Personnel Monitoring
0400-20-12-.07	Labels, Security, and Transportation Precautions	0400-20-12-.21	Radiation Surveys
0400-20-12-.08	Radiation Detection Instruments	0400-20-12-.22	Radioactive Contamination Control
0400-20-12-.09	Leak Testing of Sealed Sources	0400-20-12-.23	Security
0400-20-12-.10	Physical Inventory	0400-20-12-.24	Documents and Records Required at Field Stations
0400-20-12-.11	Records of Material Use	0400-20-12-.25	Documents and Records Required at Temporary Job-sites
0400-20-12-.12	Design and Performance Criteria for Sealed Sources	0400-20-12-.26	Notification of Incidents and Lost Sources; Abandonment Procedures for Irrecoverable Sources
0400-20-12-.13	Inspection, Maintenance, and Opening of Sources of Radiation	0400-20-12-.27	Energy Compensation Source
0400-20-12-.14	Subsurface Tracer Studies	0400-20-12-.28	Tritium Neutron Generator Target Source

~~1200-02-12-.01~~ 0400-20-12-.01 Purpose.

This chapter prescribes requirements for the issuance of a license or acceptance of registration authorizing the use of sources of radiation including sealed sources, radioactive tracers, radioactive markers, and uranium sinker bars in well logging in a single well. This chapter also prescribes radiation safety requirements for persons using sources of radiation in these operations.

Authority: T.C.A. §§ 68-202-101 et seq. and 4-5-201 et seq.

~~1200-02-12-.02~~ 0400-20-12-.02 Scope.

The provisions and requirements of this chapter are in addition to, and not in substitution for, other requirements of these ~~regulations~~ rules. The requirements set out in this chapter are not to be used to apply for the issuance of a license authorizing the ~~use~~ use of radioactive material in tracer studies involving multiple wells, such as field flooding studies, or the use of sealed sources auxiliary to well logging but not lowered into wells.

Authority: T.C.A. §§ 68-202-101 et seq. and 4-5-201 et seq.

~~1200-02-12-.03~~ 0400-20-12-.03 Definitions.

As used in this chapter, ~~0400-20-12~~, certain terms have the definitions set forth below: (Additional definitions may be found in Chapters ~~1200-02-04~~ 0400-20-04, ~~1200-02-05~~ 0400-20-05, ~~1200-02-06~~ 0400-20-06, ~~1200-02-08~~ 0400-20-08, ~~1200-02-09~~ 0400-20-09 and ~~1200-02-11~~ 0400-20-11.)

- (1) "Aquifer" means a formation, group of formations, or part of a formation that contains a sufficient quantity of permeable material to yield significant quantities of water for wells and springs.
- ~~(20)~~(2) "Energy compensation source (ECS)" means a small sealed source, with an activity not exceeding 3.7 MBq (100 microcuries), used within a logging tool, or other tool components, to provide a reference standard to maintain the tool's calibration when in use.
- ~~(2)~~(3) "Field station" means a facility where sources of radiation may be stored or used and from which equipment is dispatched to temporary job-sites.
- ~~(3)~~(4) "Fresh water aquifer" means, for the purpose of this chapter, a geologic formation that is capable of yielding fresh water to a well or spring.
- ~~(4)~~(5) "Injection tool" means a device used for controlled subsurface injection of radioactive tracer material.
- ~~(5)~~(6) "Irretrievable well logging source" means any sealed source containing radioactive material that is pulled off or not connected to the wireline that suspends the source in the well and for which all reasonable effort at recovery has been expended.
- ~~(6)~~(7) "Logging assistant" means any individual who, under the personal supervision of a logging supervisor, handles sources of radiation or radioactive tracers that are not in logging tools or shipping containers or who performs surveys required by ~~4200-02-12-21~~ Rule 0400-20-12-21.
- ~~(7)~~(8) "Logging supervisor" means an individual who uses sources of radiation or provides personal supervision in the use of sources of radiation at a temporary job-site and who is responsible to the licensee or registrant for assuring compliance with the requirements of these regulations and the conditions of the license or registration.
- ~~(8)~~(9) "Logging tool" means a device used subsurface to perform well logging.
- ~~(9)~~(10) "Personal supervision" means guidance and instruction by a logging supervisor who is physically present at a temporary job-site, who is in personal contact with logging assistants, and who can give immediate assistance.
- ~~(10)~~(11) "Radioactive marker" means radioactive material used for depth determination or direction orientation. For purposes of this chapter, this term includes radioactive collar markers and radioactive iron nails.
- ~~(11)~~(12) "Safety review" means a periodic review provided by the licensee or registrant for its employees on radiation safety aspects of well logging. The review may include, as appropriate, the results of internal inspections, new procedures or equipment, accidents or errors that have been observed, and opportunities for employees to ask safety questions.
- ~~(12)~~(13) "Sealed source" - See Rule ~~4200-02-04-04(1)(yy)~~ 0400-20-04-04.
- ~~(13)~~(14) "Source holder" means a housing or assembly into which a sealed source is placed to facilitate the handling and use of the source in well logging.
- ~~(14)~~(15) "Subsurface tracer study" means the release of unsealed radioactive material or a substance labeled with radioactive material in a single well for the purpose of tracing the movement or position of the material or substance in the well or adjacent formation.
- ~~(15)~~(16) "Surface casing for protecting fresh water aquifers" means a pipe or tube used as a lining in a well to isolate fresh water aquifers from the well.
- ~~(16)~~(17) "Temporary job-site" means a place where sources of radiation are present for the purpose of performing well logging including subsurface tracer studies.
- ~~(24)~~(18) "Tritium neutron generator target source" means a tritium source used within a neutron generator tube to

produce neutrons for use in well logging applications.

~~(17)~~(19) "Uranium sinker bar" means a weight containing depleted uranium used to pull a logging tool toward the bottom of a well.

~~(18)~~(20) "Well" means a bored, drilled, driven or dug shaft or hole whose depth is greater than the largest surface dimension.

~~(19)~~(21) "Well logging" means all operations involving the lowering and raising of measuring devices or tools which contain sources of radiation or are used to detect radioactive materials in wells for the purpose of obtaining information about the well or adjacent formations.

Authority: T.C.A. §§ 68-202-101 et seq., 68-202-201 et seq., and 4-5-201 et seq.

~~4200-02-12-.04~~ 0400-20-12-.04 Registration or Application for a License.

A person, as defined in Chapter ~~4200-02-05~~ 0400-20-05, shall file an application for a license authorizing the use of radioactive material in well logging or register radiation producing machines for use in well logging with the Division at the address in Rule ~~4200-02-04-.07~~ 0400-20-04-.07.

Authority: T.C.A. §§ 68-202-101 et seq., 68-202-201 et seq., and 4-5-201 et seq.

~~4200-02-12-.05~~ 0400-20-12-.05 Registration and License for Well Logging.

- (1) The Department may approve an application for a license for the use of radioactive material in well logging or a registration if the following requirements are met:
 - (a) The applicant shall satisfy the general requirements specified in ~~4200-02-10-.12~~ Rules 0400-20-10-12 and ~~4200-02-10-.24~~ 0400-20-10-24 and any special requirements contained in this chapter;
 - (b) The applicant or registrant shall develop a program for training logging supervisors and logging assistants and submit a description of this program which specifies the:
 1. Initial training;
 2. On-the-job training;
 3. Annual safety reviews provided by the licensee or registrant;
 4. Means the applicant or registrant will use to demonstrate the logging supervisor's knowledge and understanding of and ability to comply with the regulations, license, and the applicant's or registrant's operating and emergency procedures; and
 5. Means the applicant or registrant will use to demonstrate the logging assistant's knowledge and understanding of and ability to comply with the applicant's operating and emergency procedures;
 - (c) The applicant or registrant shall submit written operating and emergency procedures as described in ~~4200-02-12-.19~~ Rule 0400-20-12-.19 or an outline or summary of the procedures that includes the important radiation safety aspects of the procedures;
 - (d) The applicant or registrant shall establish and submit its program for annual inspections of the job performance of each logging supervisor to ensure that the regulations, license, and the applicant's or registrant's operating and emergency procedures are followed. Inspection records must be retained for ~~three~~ 3 years after each annual internal inspection;
 - (e) The applicant or registrant shall submit a description of its overall organizational structure as it applies to the radiation safety responsibilities in well logging, including specified delegations of

authority and responsibility; and

- (f) If an applicant wants to perform leak testing of sealed sources, the applicant shall identify the manufacturers and the model numbers of the leak test kits to be used. If the applicant wants to analyze its own wipe samples, the applicant shall establish procedures to be followed and submit a description of these procedures. The description must include the:
1. Instruments to be used;
 2. Methods of performing the analysis; and
 3. Experience of the person who will analyze the wipe samples. Experience shall be commensurate with the analysis to be made.

Authority: T.C.A. §§ 68-202-101 et seq. and 4-5-201 et seq.

~~1200-02-12-.06~~ 0400-20-12-.06 Agreement with Well Owner or Operator.

- (1) A licensee may perform well logging with a sealed source only after the licensee has a written agreement with the employing well owner or operator. This written agreement must identify who will meet the following requirements:
- (a) If a sealed source becomes lodged in the well, a reasonable effort will be made to recover it;
 - (b) A person may not attempt to recover a sealed source in a manner which is reasonably expected to result in its rupture;
 - (c) The radiation monitoring required in paragraph (1) of Rule ~~1200-02-12-.22~~ 0400-20-12-.22(1) will be performed;
 - (d) If the environment, any equipment, or personnel are contaminated with radioactive material, they must be decontaminated before release for unrestricted use or release from the site; and
 - (e) If the sealed source is classified as irretrievable after reasonable efforts at recovery have been expended, the following requirements must be implemented within 30 days:
 1. Each irretrievable well logging source must be immobilized and sealed in place with a cement plug.
 2. A means to prevent inadvertent intrusion on the source, unless the source is not accessible to any subsequent drilling operations; and,
 3. A permanent identification plaque, constructed of long lasting material such as stainless steel, brass, bronze, or monel, must be mounted at the surface of the well, unless the mounting of the plaque is not practical. The size of the plaque must be at least 7 inches (17 cm) square and 1/8-inch (3 mm) thick. The plaque must contain:
 - (i) The word "CAUTION";
 - (ii) The radiation symbol (the color requirement in paragraph (1) of Rule ~~1200-02-05-.110~~ 0400-20-05-.110(1) need not be met);
 - (iii) The date the source was abandoned;
 - (iv) The name of the well owner or well operator, as appropriate;
 - (v) The well name and well identification number(s) or other designation;
 - (vi) An identification of the sealed source(s) by radionuclide and quantity;

- (vii) The depth of the source and depth to the top of the plug; and
 - (viii) An appropriate warning, depending on the specific circumstances of each abandonment.¹
- (2) The licensee shall retain a copy of the written agreement for 3 years after the completion of the well logging operation.
 - (3) A licensee may apply for approval, on a case-by-case basis, of proposed procedures to abandon an irretrievable well logging source in a manner not otherwise authorized in subparagraph (1)(e) of this rule.
 - (4) A written agreement between the licensee and the well owner or operator is not required if the licensee and the well owner or operator are part of the same corporate structure or otherwise similarly affiliated. However, the licensee shall still otherwise meet the requirements in subparagraph (1)(a) through (4)(e) of this rule.

Authority: T.C.A. §§ 68-202-101 et seq., 68-202-201 et seq., and 4-5-201 et seq.

~~4200-02-12-.07~~ 0400-20-12-.07 Labels, Security, and Transportation Precautions.

(1) Labels.

- (a) The licensee may not use a source, source holder, or logging tool that contains radioactive material unless the smallest component that is transported as a separate piece of equipment with the radioactive material inside bears a durable, legible, and clearly visible marking or label. The marking or label must contain the radiation symbol specified in paragraph (1) of Rule ~~4200-02-05-.44~~ 0400-20-05-.110(4) without the conventional color requirements, and the wording "DANGER (or CAUTION) RADIOACTIVE MATERIAL."
- (b) The licensee may not use a container to store radioactive material unless the container has securely attached to it a durable, legible, and clearly visible label. The label must contain the radiation symbol specified in paragraph (1) of Rule ~~4200-02-05-.110~~ 0400-20-05-.110(4) and the wording "CAUTION (or DANGER), RADIOACTIVE MATERIAL, NOTIFY CIVIL AUTHORITIES (or NAME OF COMPANY)."
- (c) The licensee may not transport radioactive material unless the material is packaged, labeled, marked, and accompanied with appropriate shipping papers in accordance with Rule ~~4200-02-10-.30~~ 0400-20-10-.30.

(2) Security precautions during storage and transportation.

- (a) The licensee or registrant shall store each source of radiation in a storage container or transportation package. The container or package must be locked and physically secured to prevent tampering or removal of sources of radiation from storage by unauthorized personnel. The licensee shall store radioactive material in a manner which will minimize danger from explosion or fire.
- (b) The licensee or registrant shall lock and physically secure the transport packages containing sources of radiation in the transporting vehicle to prevent accidental loss, tampering, or unauthorized removal of the sources of radiation from the vehicle.

Authority: T.C.A. §§ 68-202-101 et seq., 68-202-201 et seq., and 4-5-201 et seq.

~~4200-02-12-.08~~ 0400-20-12-.08 Radiation Detection Instruments.

¹ Appropriate warnings may include: (a) "Do not drill below plug-back depth"; (b) "Do not enlarge casing"; or (c) "Do not re-enter the hole" followed by the words, "before contacting the Division of Radiological Health."
 SS-7039 (July 2010) 7 RDA 1693

- (1) The licensee or registrant shall keep a calibrated and operable radiation survey instrument capable of detecting, as appropriate, beta, gamma and x-ray radiation at each field station and temporary job-site to make the radiation surveys required by this chapter and by Chapter ~~4200-02-05~~ 0400-20-05. To satisfy this requirement, the radiation survey instrument must be capable of measuring 0.001 mSv (0.1 mrem) per hour through at least 0.5 mSv (50 mrem) per hour.
- (2) The licensee shall have available additional calibrated and operable radiation detection instruments sensitive enough to detect the low radiation and contamination levels that could be encountered if a sealed source ruptured. The licensee may own the instruments or may have a procedure to obtain them quickly from a second party.
- (3) The licensee or registrant shall have each radiation survey instrument required under paragraph (1) of this rule calibrated:
 - (a) At intervals not to exceed 6 months and after instrument servicing;
 - (b) For linear scale instruments, at two points located approximately 1/3 and 2/3 of full-scale on each scale; for logarithmic scale instruments, at midrange of each decade, and at two points of at least one decade; and for digital instruments, at appropriate points; and
 - (c) So that an accuracy within plus or minus 20 percent of the calibration standard can be demonstrated on each scale.
- (4) The licensee or registrant shall retain calibration records for a period of 3 years after the date of calibration for inspection by the Division.

Authority: T.C.A. §§ 68-202-101 et seq., 68-202-201 et seq., and 4-5-201 et seq.

~~4200-02-12-09~~ 0400-20-12-09 Leak Testing of Sealed Sources.

- (1) Testing and record keeping requirements.

Each licensee who uses a sealed source shall have the source tested for leakage periodically. The licensee shall keep a record of leak test results in units of microcuries and retain the record for inspection by the Division for ~~three (3)~~ years after the leak test is performed.

- (2) Method of testing.

The wipe of a sealed source shall be performed using a leak test kit or method approved by the Division, U.S. Nuclear Regulatory Commission, a Licensing State or an Agreement State. The wipe sample shall be taken from the nearest accessible point to the sealed source where contamination might accumulate. The wipe sample shall be analyzed for radioactive contamination. The analysis shall be capable of detecting the presence of 0.005 microcurie (185 Bq) of radioactive material on the test sample and shall be performed by a person approved by the Division, U.S. Nuclear Regulatory Commission, a Licensing State or an Agreement State to perform the analysis.

- (3) Test frequency.

- (a) Each sealed source (except an energy compensation source [ECS]) shall be tested at intervals not to exceed ~~six (6)~~ months. In the absence of a certificate from a transferor that a test has been made within the ~~six (6)~~ months before the transfer, the sealed source shall not be used until tested.
- (b) Each ECS that is not exempt from testing in accordance with paragraph (e) of this section (5) of this rule shall be tested at intervals not to exceed ~~three (3)~~ years. In the absence of a certificate from a transferor that a test has been made within the ~~three (3)~~ years before the transfer, the ECS may not be used until tested.

- (4) Removal of leaking source from service:

- (a) If the test conducted pursuant to paragraphs (1) and (2) of this rule reveals the presence of 0.005 microcurie (185 Bq) or more of removable radioactive material, the licensee shall remove the sealed source from service immediately and have it decontaminated, repaired, or disposed of by an Agreement State, U.S. Nuclear Regulatory Commission, or a Licensing State licensee that is authorized to perform these functions. The licensee shall check the equipment associated with the leaking source for radioactive contamination and, if contaminated, have it decontaminated or disposed of by a Department, U.S. Nuclear Regulatory Commission, an Agreement State or Licensing State licensee that is authorized to perform these functions.
 - (b) Licensees shall submit written reports to the Division, at the address in Rule ~~1200-02-04-.07~~ 0400-20-04-.07, within ~~five (5)~~ 5 days of receiving the test results. The report must describe the equipment involved in the leak, the test results, any contamination which resulted from the leaking source, and the corrective actions taken up to the time the report is made.
- (5) The following sealed sources are not subject to the periodic leak test requirements set out in paragraphs (1) through (4) of this rule:
- (a) Hydrogen-3 sources;
 - (b) Sources containing radioactive material with a half-life of 30 days or less;
 - (c) Sources containing radioactive material in gaseous form;
 - (d) Sources of beta- or gamma-emitting radioactive material with an activity of 100 microcuries (3,700,000 Bq) or less; and
 - (e) Sources of alpha- or neutron-emitting radioactive material with an activity of 10 microcuries (370,000 Bq) or less.

Authority: T.C.A. §§ 68-202-101 et seq., 68-202-201 et seq., and 4-5-201 et seq.

~~1200-02-12-.10~~ 0400-20-12-.10 Physical Inventory.

Each licensee or registrant shall conduct a semi-annual physical inventory to account for all sources of radiation received and possessed. The licensee or registrant shall retain records of the inventory for 3 years from the date of the inventory for inspection by the Division. The inventory must indicate the quantity and kind of sources of radiation, the location of the sources of radiation, the date of the inventory, and the name of the individual conducting the inventory. Physical inventory records may be combined with leak test records.

Authority: T.C.A. §§ 68-202-101 et seq. and 4-5-201 et seq.

~~1200-02-12-.11~~ 0400-20-12-.11 Records of Material Use.

- (1) Each licensee or registrant shall maintain records for each use of sources of radiation showing:
 - (a) The make, model number, and a serial number or a description of each source of radiation used;
 - (b) In the case of unsealed material used for subsurface tracer studies, the radionuclide and quantity of activity used in a particular well and the disposition of any unused tracer material;
 - (c) The identity of the logging supervisor who is responsible for the sources of radiation and the identity of logging assistants present; and
 - (d) The location and date of use of the sources of radiation.
- (2) The licensee or registrant shall make the records required by paragraph (1) of this rule available for inspection by the Division. The licensee or registrant shall retain the records for 3 years from the date of the recorded event.

Authority: T.C.A. §§ 68-202-101 et seq. and 4-5-201 et seq.

~~1200-02-12-12~~ 0400-20-12-.12 Design and Performance Criteria for Sealed Sources.

- (1) A licensee may use a sealed source in well logging if the sealed source:
 - (a) Is doubly encapsulated;
 - (b) Contains licensed material whose chemical and physical forms are as insoluble and nondispersible as practical; and
 - (c) Meets the requirements in paragraphs (2), (3) and (4) of this rule.
- (2) For a sealed source manufactured on or before July 14, 1989, a licensee may use the sealed source, for use in well logging applications if it meets the requirements of USASI N5.10-1968, "Classification of Sealed Radioactive Sources," or the requirements in paragraph (3) or (4) of this rule.
- (3) For a sealed source manufactured after July 14, 1989, a licensee may use the sealed source, for use in well logging applications if it meets the oil-well logging requirements of ANSI/HPS N43.6-1997, "Sealed Radioactive Sources - Classification."
- (4) For a sealed source manufactured after July 14, 1989, a licensee may use the sealed source, for use in well logging applications, if:
 - (a) The sealed source's prototype has been tested and found to maintain its integrity after each of the following tests:
 1. Temperature.

The test source must be held at – 40° C for 20 minutes, 600° C for 1 hour, and then be subject to a thermal shock test with a temperature drop from 600° C to 20° C within 15 seconds.
 2. Impact test.

A 5 kg steel hammer, 2.5 cm in diameter, must be dropped from a height of 1 m onto the test source.
 3. Vibration.

The test source must be subject to a vibration from 25 Hz to 500 Hz at 5 g amplitude for 30 minutes.
 4. Puncture test.

A 1 gram hammer and pin, 0.3 cm pin diameter must be dropped from a height of 1 m onto the test source.
 5. Pressure test.

The test source must be subjected to an external pressure of 24,600 pounds per square inch absolute (1.695×10^7 pascals).
- (5) The requirements in paragraphs (1), (2), (3) and (4) of this rule do not apply to sealed sources that contain licensed material in gaseous form.
- (6) The requirements in paragraph (1), (2), (3) and (4) of this rule do not apply to energy compensation sources (ECS). ECSs shall be registered with the Nuclear Regulatory Commission under 10 CFR 32.210

or with an Agreement State.

Authority: T.C.A. §§ 68-202-201 et seq., and 4-5-201 et seq.

~~4200-02-12-13~~ 0400-20-12-13 Inspection, Maintenance, and Opening of Sources of Radiation.

- (1) Each licensee or registrant shall visually check sources of radiation including source holders, logging tools, and source handling tools, for defects before each use to ensure that the equipment is in good working condition and that required labeling is present. If defects are found, the equipment must be removed from service until repaired, and a record must be made listing:
 - (a) The date of check;
 - (b) Name of inspector;
 - (c) Equipment involved;
 - (d) Defects found; and
 - (e) Repairs made.
- (2) The required records in paragraph (1) of this rule must be maintained for 3 years after the defect is found.
- (3) Each licensee or registrant shall have a program for semiannual visual inspection and routine maintenance of sources of radiation including source holder, logging tools, injection tools, source handling tools, storage containers, transport containers, and uranium sinker bars to ensure that the required labeling is legible and that no physical damage is visible. If defects are found, the equipment must be removed from service until repaired, and a record must be made listing:
 - (a) The date of check;
 - (b) Equipment involved;
 - (c) Inspection and maintenance operations performed;
 - (d) Any defects found; and
 - (e) Any actions taken to correct the defects.
- (4) The records required in paragraph (3) of this rule must be retained for 3 years after the defect is found.
- (5) Removal of a sealed source from a source holder or logging tool, and maintenance on sealed sources or holders in which sealed sources are contained may not be performed by the licensee unless a written procedure developed pursuant to Rule ~~4200-02-12-19~~ 0400-20-12-19 has been approved either by the Division pursuant to subparagraph (1)(c) of Rule ~~4200-02-12-05~~ 0400-20-12-05(1)(c) or by the U.S. Nuclear Regulatory Commission, a Licensing State or an Agreement State.
- (6) If a sealed source is stuck in the source holder, the licensee may not perform any operation, such as drilling, cutting, or chiseling, on the source holder unless the licensee is specifically approved by the Division, U.S. Nuclear Regulatory Commission, a Licensing State or an Agreement State to perform this operation.
- (7) The opening, repair, or modification of any sealed source must be performed by persons specifically approved to do so by the Division, U.S. Nuclear Regulatory Commission, a Licensing State or an Agreement State.

Authority: T.C.A. §§ 68-202-101 et seq. and 4-5-201 et seq.

~~4200-02-12-14~~ 0400-20-12-14 Subsurface Tracer Studies.

- (1) The licensee shall require all personnel handling radioactive tracer material to use protective gloves and, if required by the license, other protective clothing and equipment. The licensee shall take precautions to avoid ingestion or inhalation of radioactive tracer material and to avoid contamination of field stations and temporary job-sites.
- (2) A licensee may not knowingly inject radioactive material into aquifers unless specifically authorized to do so by the Division of Radiological Health and any other appropriate State agency.

Authority: T.C.A. §§ 68-202-101 et seq. and 4-5-201 et seq.

~~4200-02-12-.15~~ 0400-20-12-.15 Radioactive Markers.

The licensee may use radioactive markers in wells only if the individual markers contain quantities of radioactive material not exceeding the quantities specified in Schedule RHS 8-31, Chapter Rule 4200-02-05-.161 0400-20-05-.161.

Authority: T.C.A. §§ 68-202-101 et seq., 68-202-201 et seq., and 4-5-201 et seq.

~~4200-02-12-.16~~ 0400-20-12-.16 Uranium Sinker Bars.

The licensee may use a uranium sinker bar in well logging only if it is legibly impressed with the words "CAUTION - RADIOACTIVE - DEPLETED URANIUM" and "NOTIFY CIVIL AUTHORITIES (or COMPANY NAME) IF FOUND."

Authority: T.C.A. §§ 68-202-101 et seq. and 4-5-201 et seq.

~~4200-02-12-.17~~ 0400-20-12-.17 Use of a Sealed Source in a Well without a Surface Casing.

The licensee may use a sealed source in a well without a surface casing for protecting aquifers only if the licensee follows a procedure for reducing the probability of the source becoming lodged in the well. The procedure must be approved by the Division pursuant to subparagraph (1)(c) of Rule 4200-02-12-.05 0400-20-12-.05(1)(c) or by the U.S. Nuclear Regulatory Commission, a Licensing State or another Agreement State.

Authority: T.C.A. §§ 68-202-101 et seq. and 4-5-201 et seq.

~~4200-02-12-.18~~ 0400-20-12-.18 Training.

- (1) The licensee or registrant may not permit an individual to act as a logging supervisor until that person:
 - (a) Has completed training in the subjects outlined in paragraph (5) of this rule;
 - (b) Has received copies of, and instruction in:
 1. These regulations;
 2. The license or registration under which the logging supervisor will perform well logging; and
 3. The licensee's or registrant's operating and emergency procedures required by Rule ~~4200-02-12-.19~~ 0400-20-12-.19;
 - (c) Has completed on-the-job training and demonstrated competence in the use of sources of radiation, remote handling tools and radiation survey instruments by a field evaluation; and
 - (d) Has demonstrated understanding of the requirements in subparagraphs (4)(a) and (b) of this rule paragraph by successfully completing a written test.
- (2) The licensee or registrant may not permit an individual to act as a logging assistant until that person:

- (a) Has received instruction in applicable sections of these regulations;
 - (b) Has received copies of, and instruction in, the licensee's or registrant's operating and emergency procedures required by Rule ~~1200-02-12-19~~ 0400-20-12-19;
 - (c) Has demonstrated understanding of these regulations and of the licensee's or registrant's operating and emergency procedures listed in subparagraphs (2)(a) and (b) of this rule paragraph by successfully completing a written or oral test; and
 - (d) Has received instruction in the use of sources of radiation, remote handling tools, and radiation survey instruments, as appropriate for the logging assistant's intended job responsibilities.
- (3) The licensee or registrant shall provide safety reviews for logging supervisors and logging assistants at least once during each calendar year.
- (4) The licensee shall maintain a record on each logging supervisor's and logging assistant's training and annual safety review. The training records must include copies of written tests and dates of oral tests. The training records must be retained until 3 years following the termination of employment. Records of annual safety reviews must list the topics discussed and be retained for 3 years.
- (5) The licensee or registrant shall include the following subjects in the training required in subparagraph (1)(a) of this rule:
- (a) Fundamentals of radiation safety including:
 - 1. Characteristics of radiation;
 - 2. Units of radiation dose and quantity of radioactivity;
 - 3. Hazards of exposure to radiation;
 - 4. Levels of radiation from sources of radiation;
 - 5. Methods of controlling radiation dose (time, distance, and shielding); and
 - 6. Radiation safety practices, including prevention of contamination, and methods of decontamination.
 - (b) Radiation detection instruments including:
 - 1. Use, operation, calibration, and limitations of radiation survey instruments;
 - 2. Survey techniques; and
 - 3. Use of personnel monitoring equipment.
 - (c) Equipment to be used including:
 - 1. Operation of equipment, including source handling equipment and remote handling tools;
 - 2. Storage, control, and disposal of radioactive material; and
 - 3. Maintenance of equipment;
 - (d) The requirements of pertinent regulations; and
 - (e) Case histories of accidents in well logging.

Authority: T.C.A. §§ 68-202-101 et seq. and 4-5-201 et seq.

~~4200-02-12-.19~~ 0400-20-12-.19 Operating and Emergency Procedures.

- (1) Each licensee or registrant shall develop and follow written operating and emergency procedures that cover:
 - (a) The handling and use of sources of radiation including the use of sealed sources in wells without surface casing for protecting aquifers, if appropriate;
 - (b) The use of remote handling tools for handling sealed sources and radioactive tracer material except low-activity calibration sources;
 - (c) Methods and occasions for conducting radiation surveys, including surveys for detecting contamination, as required by paragraphs (3) through (5) of Rule ~~4200-02-12-.24~~ 0400-20-12-.21(3) through (5);
 - (d) Minimizing personnel exposure including exposures from inhalation and ingestion of radioactive tracer materials;
 - (e) Methods and occasions for locking and securing stored sources of radiation;
 - (f) Personnel monitoring and the use of personnel monitoring equipment;
 - (g) Transportation of radioactive materials to field stations or temporary job-sites, packaging of radioactive materials for transport in vehicles, placarding of vehicles when needed, and physically securing sources of radiation in transport vehicles during transportation to prevent accidental loss, tampering, or unauthorized removal;
 - (h) Picking up, receiving, and opening packages containing radioactive materials, in accordance with Rule ~~4200-02-12-.115~~ 0400-20-05-.115;
 - (i) For the use of tracers, decontamination of the environment, equipment, and personnel;
 - (j) Maintenance of records generated by logging personnel at temporary job-sites;
 - (k) The inspection and maintenance of sources of radiation including sealed sources, source holders, logging tools, injection tools, source handling tools, storage containers, transport containers, and uranium sinker bars as required by Rule ~~4200-02-12-.43~~ 0400-20-12-.13;
 - (l) Identifying and reporting to the Division defects and noncompliance as required;
 - (m) Actions to be taken if a sealed source is lodged in a well;
 - (n) Instructions for notifying responsible persons in the event of an accident; and
 - (o) Actions to be taken if a sealed source is ruptured including actions to prevent the spread of contamination and minimize inhalation and ingestion of radioactive materials and actions to obtain suitable radiation survey instruments as required by paragraph (2) of Rule ~~4200-02-12-.08~~ 0400-20-12-.08(2).

Authority: T.C.A. §§ 68-202-101 et seq., 68-202-201 et seq., and 4-5-201 et seq.

~~4200-02-12-.20~~ 0400-20-12-.20 Personnel Monitoring.

- (1) The licensee or registrant shall not permit an individual to act as a logging supervisor or logging assistant unless that person wears, at all times during the handling of sources of radiation, a personnel dosimeter that is processed and evaluated by an accredited National Voluntary Accreditation Program (NVLAP) processor. Each personnel dosimeter shall be assigned to and worn by only one individual. Film badges

shall be replaced at least monthly and other personnel dosimeters replaced at least quarterly. After replacement, each personnel dosimeter shall be promptly processed.

- (2) The licensee shall provide bioassay services to individuals using radioactive materials in subsurface tracer studies if required by the license.
- (3) The licensee or registrant shall retain records of personnel dosimeters and bioassay results for inspection until the Division authorizes disposition of the records.

Authority: T.C.A. §§ 68-202-101 et seq., 68-202-201 et seq., and 4-5-201 et seq.

~~4200-02-12-24~~ 0400-20-12-.21 Radiation Surveys.

- (1) The licensee or registrant shall make all radiation surveys necessary, including the surveys required under paragraphs (2) through (5) of this rule, to ensure protection of health and safety of each area where radioactive materials and other sources of radiation are used and stored.
- (2) Before transporting radioactive materials, the licensee shall make a radiation survey of the position occupied by each individual in the vehicle and of the exterior of each vehicle used to transport the radioactive materials.
- (3) If the sealed source assembly is removed from the logging tool before departure from the temporary job-site, the licensee shall confirm that the logging tool is free of contamination by energizing the logging tool detector or by using a survey meter.
- (4) If the licensee has reason to believe that, as a result of any operation involving a sealed source, the encapsulation of the sealed source could be damaged by the operation, the licensee shall conduct a radiation survey, including a contamination survey, during and after the operation.
- (5) The licensee shall make a radiation survey at the temporary job-site before and after each subsurface tracer study to confirm the absence of contamination.
- (6) The results of surveys required under paragraphs (1) through (5) of this rule must be recorded and must include the date of the survey, the name of the individual making the survey, the identification of the survey instrument used, and the location of the survey. The licensee or registrant shall retain records of surveys for inspection by the Division for 3 years after they are made.

Authority: T.C.A. §§ 68-202-101 et seq. and 4-5-201 et seq.

~~4200-02-12-22~~ 0400-20-12-.22 Radioactive Contamination Control.

- (1) If the licensee detects evidence that a sealed source has ruptured or radioactive materials have caused contamination, the licensee shall initiate immediately the emergency procedures required by ~~4200-02-12-19~~ Rule 0400-20-12-.19.
- (2) If contamination results from the use of radioactive material in well logging, the licensee shall decontaminate all work areas, equipment, and unrestricted areas.
- (3) During efforts to recover a sealed source lodged in the well, a licensee shall continuously monitor, with an appropriate radiation detection instrument or logging tool with a radiation detector, the circulating fluids from the well, if any, to check for contamination resulting from damage to the sealed source.

Authority: T.C.A. §§ 68-202-101 et seq. and 4-5-201 et seq.

~~4200-02-12-23~~ 0400-20-12-.23 Security.

- (1) A logging supervisor must be physically present at a temporary job-site whenever sources of radiation are being handled or are not stored and locked in a vehicle or storage place. The logging supervisor may leave the job-site in order to obtain assistance if a source becomes lodged in a well.

- (2) During well logging, except when radiation sources are below ground or in shipping or storage containers, the logging supervisor or other individual designated by the logging supervisor shall maintain direct surveillance of the operation to prevent unauthorized entry into a restricted area, as defined in Rule ~~4200-02-12-32(62)~~ 0400-20-05-32.

Authority: T.C.A. §§ 68-202-101 et seq. and 4-5-201 et seq.

~~4200-02-12-24~~ 0400-20-12-24 Documents and Records Required at Field Stations.

- (1) Each licensee or registrant shall maintain the following documents and records at the field station:
- (a) A copy of these regulations;
 - (b) The license authorizing the use of radioactive material or registration;
 - (c) Operating and emergency procedures required by Rule ~~4200-02-12-19~~ 0400-20-12-19;
 - (d) The record of radiation survey instrument calibrations required by Rule ~~4200-02-12-08~~ 0400-20-12-08;
 - (e) The record of leak test results required by Rule ~~4200-02-12-09~~ 0400-20-12-09;
 - (f) Physical inventory records required by Rule ~~4200-02-12-10~~ 0400-20-12-10;
 - (g) Utilization records required by Rule ~~4200-02-12-11~~ 0400-20-12-11;
 - (h) Records of inspection and maintenance required by Rule ~~4200-02-12-13~~ 0400-20-12-13;
 - (i) Training records required by paragraph (4) of Rule ~~4200-02-12-18~~ 0400-20-12-18(4); and
 - (j) Survey records required by paragraph (6) of Rule ~~4200-02-12-21~~ 0400-20-12-21(6).

Authority: T.C.A. §§ 68-202-101 et seq. and 4-5-201 et seq.

~~4200-02-12-25~~ 0400-20-12-25 Documents and Records Required at Temporary Job-sites.

- (1) Each licensee or registrant conducting operations at a temporary job-site shall maintain the following documents and records at the temporary job-site until the well logging operation is completed:
- (a) Operating and emergency procedures required by Rule ~~4200-02-12-19~~ 0400-20-12-19;
 - (b) Evidence of latest calibration of the radiation survey instruments in use at the site required by Rule ~~4200-02-12-08~~ 0400-20-12-08;
 - (c) Latest survey records required by paragraphs (2), (3) and (5) of Rule ~~4200-02-12-21~~ 0400-20-12-21(2), (3), and (5);
 - (d) The shipping papers for the transportation of radioactive materials; and
 - (e) When operating under reciprocity pursuant to Rule ~~4200-02-10-29~~ 0400-20-10-29, a copy of the license authorizing use of radioactive materials or a copy of registration for other sources of radiation.

Authority: T.C.A. §§ 68-202-101 et seq. and 4-5-201 et seq.

~~4200-02-12-26~~ 0400-20-12-26 Notification of Incidents and Lost Sources; Abandonment Procedures for Irretrievable Sources.

- (1) The licensee shall immediately notify the Division of Radiological Health by telephone and subsequently, within 30 days, by confirmatory letter if the licensee knows or has reason to believe that a sealed source has been ruptured. The letter must designate the well or other location, describe the magnitude and extent of the escape of radioactive materials, assess the consequences of the rupture, and explain efforts planned or being taken to mitigate these consequences.
- (2) The licensee or registrant shall notify the Division of Radiological Health of the theft or loss of radioactive materials, radiation overexposures, excessive levels and concentrations of radiation, and certain other accidents as required by Rules ~~1200-02-05-140~~ 0400-20-05-140, ~~1200-02-05-141~~ 0400-20-05-141, and ~~1200-02-05-143~~ 0400-20-05-143.
- (3) If a sealed source becomes lodged in a well, and when it becomes apparent that efforts to recover the sealed source will not be successful, the licensee shall:
 - (a) Notify the Division of Radiological Health by telephone of the circumstances that resulted in the inability to retrieve the source and:
 1. Obtain Division approval to implement abandonment procedures; or
 2. That the licensee implemented abandonment before receiving Division approval because the licensee believed there was an immediate threat to public health and safety; and
 - (b) Advise the well owner or operator as appropriate, of the abandonment procedures under paragraph (1) or (3) of Rule ~~1200-02-12-06~~ 0400-20-12-06(1) or (3); and
 - (c) Either ensure that abandonment procedures are implemented within 30 days after the sealed source has been classified as irretrievable or request an extension of time if unable to complete the abandonment procedures.
- (4) Within 30 days after a sealed source has been classified as irretrievable, the licensee shall make a written report to the Division at the address in Rule ~~1200-02-04-07~~ 0400-20-04-07. The licensee shall send a copy of the report to each state or Federal agency that issued permits or otherwise approved of the drilling operation. The report must contain the following information:
 - (a) Date of occurrence;
 - (b) A description of the irretrievable well logging source involved including the radionuclide and its quantity, chemical, and physical form;
 - (c) Surface location and identification of the well;
 - (d) Results of efforts to immobilize and seal the source in place;
 - (e) A brief description of the attempted recovery effort;
 - (f) Depth of the source;
 - (g) Depth of the top of the cement plug;
 - (h) Depth of the well;
 - (i) The immediate threat to public health and safety justification for implementing abandonment if prior Division approval was not obtained in accordance with part (3)(a)2 of this rule;
 - (j) Any other information, such as a warning statement, contained on the permanent identification plaque; and
 - (k) State and Federal agencies receiving a copy of this report.

Authority: T.C.A. §§ 68-202-101 et seq., 68-202-201 et seq., and 4-5-201 et seq.

~~4200-02-12-.27~~ 0400-20-12-.27 Energy Compensation Source.

- (1) The licensee may use an energy compensation source (ECS) that is contained within a logging tool, or other tool components, only if the ECS contains quantities of licensed material not exceeding 100 microcuries (3.7 MBq).
 - (a) For well logging with a surface casing for protecting fresh water aquifers, use of the ECS is only subject to the requirements of Rules ~~4200-02-12-.09~~ 0400-20-12-.09, -.10 and -.11.
 - (b) For well logging without a surface casing for protecting fresh water aquifers, use of the ECS is only subject to the requirements of Rules ~~4200-02-12-.06~~ 0400-20-12-.06, -.09, -.10, -.11, -.17 and -.26.

~~4200-02-12-.28~~ 0400-20-12-.28 Tritium Neutron Generator Target Source.

- (1) Use of a tritium neutron generator target source, containing quantities not exceeding 30 curies (1,110 MBq) and in a well with a surface casing to protect fresh water aquifers, is subject to the requirements of this chapter except Rules ~~4200-02-12-.06~~ 0400-20-12-.06, -.12, and -.26.
- (2) Use of a tritium neutron generator target source, containing quantities exceeding 30 curies (1,110 MBq) or in a well without a surface casing to protect fresh water aquifers, is subject to the requirements of this chapter except Rule ~~4200-02-12-.12~~ 0400-20-12-.12.

Authority: T.C.A. §§ 68-202-101 et seq., 68-202-201 et seq., and 4-5-201 et seq.

G.O.C. STAFF RULE ABSTRACT

DEPARTMENT: Environment and Conservation

DIVISION: Remediation

SUBJECT: Testing and Cleaning Quarantined Clandestine Drug
Manufacturing Sites

STATUTORY AUTHORITY: Tennessee Code Annotated, Section 68-212-501 et seq.

EFFECTIVE DATES: May 23, 2012 through June 30, 2013

FISCAL IMPACT: Minimal

STAFF RULE ABSTRACT: This rules changes the numbering designation of rules
from 1200-01-.19 to 0400-15-.02. These rules also correct
typographical errors in these rules.

Public Hearing Comments

One copy of a document containing responses to comments made at the public hearing must accompany the filing pursuant to T.C.A. §4-5-222. Agencies shall include only their responses to public hearing comments, which can be summarized. No letters of inquiry from parties questioning the rule will be accepted. When no comments are received at the public hearing, the agency need only draft a memorandum stating such and include it with the Rulemaking Hearing Rule filing. Minutes of the meeting will not be accepted. Transcripts are not acceptable.

There were no comments received during the comment period.

Impact on Local Governments

Pursuant to T.C.A. §§4-5-220 and 4-5-228 "any rule proposed to be promulgated shall state in a simple declarative sentence, without additional comments on the merits of the policy of the rules or regulation, whether the rule or regulation may have a projected impact on local governments." (See Public Chapter Number 1070 (<http://state.tn.us/sos/acts/106/pub/pc1070.pdf>) of the 2010 Session of the General Assembly)

This rulemaking action will not have an impact on local government.

Department of State
Division of Publications
 312 Rosa L. Parks Avenue, 8th Floor Snodgrass/TN Tower
 Nashville, TN 37243
 Phone: 615-741-2650
 Fax: 615-741-5133
 Email: register.information@tn.gov

For Department of State Use Only

Sequence Number: PEDLINE
 Rule ID(s): _____
 File Date: _____
 Effective Date: _____

Rulemaking Hearing Rule(s) Filing Form

Rulemaking Hearing Rules are rules filed after and as a result of a rulemaking hearing. T.C.A. §4-5-205

Agency/Board/Commission:	Environment and Conservation
Division:	Remediation
Contact Person:	Robert L. Powell
Address:	4 th Floor, L&C Annex 401 Church Street Nashville, Tennessee
Zip:	37243-1538
Phone:	(615) 532-0916
Email:	Robert.Powell@tn.gov

Revision Type (check all that apply):

- Amendment
 New
 Repeal

Rule(s) Revised (ALL chapters and rules contained in filing must be listed here. If needed, copy and paste additional tables to accommodate multiple chapters. Please enter only ONE Rule Number/Rule Title per row)

Chapter Number	Chapter Title
0400-15-02	Standards for Testing and Cleaning Quarantined Clandestine Drug Manufacturing Sites
Rule Number	Rule Title
0400-15-02-.01	Standards for Determining Living Space Safe for Human Use
0400-15-02-.02	Use of Qualified Professionals for Sampling and Cleanup

Chapter Number	Chapter Title
1200-01-19	Standards for Testing and Cleaning Quarantined Clandestine Drug Manufacturing Sites
Rule Number	Rule Title
1200-01-19-.01	Standards for Determining Living Space Safe for Human Use
1200-01-19-.02	Use of Qualified Professionals for Sampling and Cleanup

(Place substance of rules and other info here. Statutory authority must be given for each rule change. For information on formatting rules go to <http://state.tn.us/sos/rules/1360/1360.htm>)

New Rule

Chapter 0400-15-02

Standards for Testing and Cleaning Quarantined Clandestine Drug Manufacturing Sites

Table of Contents

0400-15-02-.01 Standards for Determining Living Space Safe for Human Use

0400-15-02-.02 Use of Qualified Professionals for Sampling and Cleanup

~~1200-01-19-.01~~ 0400-15-02-.01 Standards for Determining Living Space Safe for Human Use

- (1) Methamphetamine shall not exceed 0.1 microgram/100 cm² on any surfaces.
- (2) Volatile Organic Compounds shall not exceed 1 ppm in air as measured under normal inhabitable ventilation conditions.
- (3) If it is determined that lead or mercury were used in the lab process, the standard for cleanup of lead on any surface shall not exceed 40µg/ft², and mercury shall not exceed 50 nanograms/m³ for indoor air. Lead acetate and mercuric chloride are used in the Amalgam process that uses phenylpropanone (P2P). This process is not commonly used, but may occasionally be encountered.

Authority: T.C.A. §§ 68-212-501, et seq. and 4-5-201 et seq.

~~1200-01-19-.02~~ 0400-15-02-.02 Use of Qualified Professionals for Sampling and Cleanup.

- (1) Samples shall be collected and interpreted by a professional certified by the Commissioner as being able to perform the services of an industrial hygienist. Any person holding a certification from the American Board of Industrial Hygienists as a Certified Industrial Hygienist is deemed certified by this rule as being able to perform these services. Other persons who have the qualifications as industrial hygienists under T.C.A. § 62-40-101 may make a written request to the Commissioner to be included on the list of persons or entities to perform the services of industrial hygienists for the purposes of these rules.
- (2) Clean up of properties shall be performed by a professional or company certified by the Commissioner as being able to perform the services of cleaning up sites used to manufacture methamphetamines. Any person holding a certification from the American Board of Industrial Hygienist as a Certified Industrial Hygienist is deemed certified by this rule as being able to perform clean up services at these sites. Other persons may make a written request to the Commissioner seeking certification to perform these services.

Authority: T.C.A. §§ 68-212-501, et seq. and 4-5-201 et seq.

G.O.C. STAFF RULE ABSTRACT

DEPARTMENT: Environment and Conservation

DIVISION: Radiological Health

SUBJECT: Rule Reorganization

STATUTORY AUTHORITY: Tennessee Code Annotated, Section 68-202-101 et seq.

EFFECTIVE DATES: May 22, 2012 through June 30, 2013

FISCAL IMPACT: Minimal

STAFF RULE ABSTRACT:

These rulemaking changes reflect a reorganization of all TDEC rules in order to be more logical and user friendly. This rulemaking affects Chapters 1200-02-04, 1200-02-05, 1200-02-06, 1200-02-07, 1200-02-08, 1200-02-09, 1200-02-10, 1200-02-11 and 1200-02-12. Its various additions and modifications will incorporate:

- a. Changes to the numbering designation of Radiological Health rules from 1200-02 to 0400-20;
- b. Correcting typographical errors throughout all Chapters; and
- c. Deleting obsolete language.