

or she is paid by the school district and/or agency to serve as a surrogate parent.

(5) Responsibilities. A surrogate parent may represent the student in all matters relating to:

(a) The identification, assessment, and educational placement of the student; and

(b) The provision of free special education and related services to the student. [Statutory Authority: RCW 28A.13.070(7), 81-19-012 (Order 81-25), § 392-171-581, filed 9/4/81; 80-11-054 (Order 80-31), § 392-171-581, filed 8/19/80.]

**WAC 392-171-786 Repealed.** See Disposition Table at beginning of this chapter.

## Title 402 WAC RADIATION CONTROL AGENCY

### Chapters

<b>402-12</b>	<b>General provisions.</b>
<b>402-22</b>	<b>Specific licenses.</b>
<b>402-52</b>	<b>Uranium and/or thorium mill operation and stabilization of mill tailing piles.</b>

### Chapter 402-12 WAC GENERAL PROVISIONS

WAC  
402-12-050 Definitions.

**WAC 402-12-050 Definitions.** As used in these regulations, these terms have the definitions set forth below. Additional definitions used only in a certain part will be found in that part.

(1) "Accelerator produced material" means any material made radioactive by exposing it in a particle accelerator.

(2) "Act" means Nuclear Energy and Radiation Legislation chapter 70.98 RCW.

(3) "Agreement state" means any state with which the United States Nuclear Regulatory Commission has entered into an effective agreement under section 274 b. of the Atomic Energy Act of 1954, as amended (73 Stat. 689).

(4) "Airborne radioactive material" means any radioactive material dispersed in the air in the form of dusts, fumes, mists, vapors, or gases.

(5) "Airborne radioactivity area" means (a) any room, enclosure, or operating area in which airborne radioactive material exists in concentrations in excess of the amounts specified in Appendix A, Table I, Column 1 of chapter 402-24 WAC Part D; or (b) any room, enclosure, or operating area in which airborne radioactive material exists in concentrations which, averaged over the number of hours in any week during which individuals are in the area, exceed 25 percent of the amounts specified in WAC 402-24-220, Appendix A, Table I, Column 1.

(6) "Byproduct material" means: (a) Any radioactive material (except special nuclear material) yielded in or made radioactive by exposure to the radiation incident to the process of producing or utilizing special nuclear material, and (b) the tailings or wastes produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material content.

(7) "Calendar quarter" means not less than 12 consecutive weeks nor more than 14 consecutive weeks. The first calendar quarter of each year shall begin in January and subsequent calendar quarters shall be so arranged such that no day is included in more than one calendar quarter and no day in any one year is omitted from inclusion within a calendar quarter. No licensee or registrant shall change the method observed by him of determining calendar quarters for purposes of these regulations except at the beginning of a calendar year.

(8) "CFR" means Code of Federal Regulations.

(9) "Controlled area." See "Restricted area."

(10) "Curie" means a unit of measurement of radioactivity. One curie (Ci) is that quantity of radioactive material which decays at the rate of  $3.7 \times 10^{10}$  transformations per second (tps). Commonly used submultiples of the curie are the millicurie and the microcurie. One millicurie (mCi) = 0.001 curie =  $3.7 \times 10^7$  tps. One microcurie (uCi) = 0.000001 curie =  $3.7 \times 10^4$  tps. One picocurie (pCi) =  $10^{-12}$  Ci. One nanocurie (nCi) =  $10^{-9}$  Ci.

(11) "Department" means the department of social and health services which has been designated as the state radiation control agency.

(12) "Depleted uranium" means the source material uranium in which the isotope uranium-235 is less than 0.711 weight percent of the total uranium present. Depleted uranium does not include special nuclear material.

(13) "Dose" as used in these regulations shall mean absorbed dose or dose equivalent as appropriate.

(a) "Absorbed dose" is the energy imparted to matter by ionizing radiation per unit mass of irradiated material at the place of interest. The special unit of absorbed dose is the rad. (See rad.)

(b) "Dose equivalent" is a quantity that expresses on a common scale for all radiation a measure of the postulated effect on a given organ. It is defined as the absorbed dose in rads times certain modifying factors. The unit of dose equivalent is the rem. (See rem.)

(14) "Dose commitment" means the total radiation dose to a part of the body that will result from retention in the body of radioactive material. For purposes of estimating the dose commitment, it is assumed that from the time of intake the period of exposure to retained material will not exceed fifty years.

(15) "Exposure" means the quotient of dQ by dm where "dQ" is the absolute value of the total charge of the ions of one sign produced in air when all the electrons (negatrons and positrons) liberated by photons in a volume element of air having "dm" are completely stopped in air. (The special unit of exposure is the roentgen (R).)\*

## NOTE:

\*When not underlined as above the term 'exposure' has a more general meaning in these regulations.

(16) "Exposure rate" means the exposure per unit of time, such as R/min., mR/h, etc.

(17) "Former United States Atomic Energy Commission (AEC) or United States Nuclear Regulatory Commission (NRC) licensed facilities" means nuclear reactors, nuclear fuel reprocessing plants, uranium enrichment plants, or critical mass experimental facilities where AEC or NRC licenses have been terminated.

(18) "Healing arts" means the disciplines of medicine, dentistry, osteopathy, chiropractic, podiatry, and veterinary medicine.

(19) "High radiation area" means any area, accessible to individuals, in which there exists radiation at such levels that a major portion of the body could receive in any one hour a dose in excess of 100 millirems.

(20) "Human use" means the intentional, internal or external administration of radiation or radioactive material to human beings.

(21) "IND" means investigatory new drug for which an exemption has been claimed under the United States Food, Drug and Cosmetic Act.

(22) "Individual" means any human being.

(23) "Inspection" means an official examination or observation by the department including but not limited to, tests, surveys, and monitoring to determine compliance with rules, regulations, orders, requirements and conditions of the department.

(24) "Irretrievable source" means any sealed source containing licensed material which is pulled off or not connected to the wireline downhole and for which all reasonable effort at recovery, as determined by the department, has been expended.

(25) "License" means a license issued by the department in accordance with the regulations adopted by the department.

(26) "Licensee" means any person who is licensed by the department in accordance with these regulations and the act.

(27) "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.

(28) "NARM" means any naturally occurring or accelerator-produced radioactive material except source material.

(29) "Natural radioactivity" means radioactivity of naturally occurring nuclides.

(30) "NDA" means a new drug application which has been submitted to the United States Food and Drug Administration.

(31) "Occupational dose" means exposure of an individual to radiation in a restricted area; or in the course of employment in which the individual's duties involve exposure to radiation; provided, that occupational dose shall not be deemed to include any exposure of an individual to radiation for the purpose of diagnosis or therapy of such individual.

(32) "Ore refineries" mean all processors of a radioactive material ore.

(33) "Particle accelerator" means any machine capable of accelerating electrons, protons, deuterons, or other charged particles in a vacuum and of discharging the resultant particulate or other radiation into a medium at energies usually in excess of 1 MeV.

(34) "Person" means any individual, corporation, partnership, firm, association, trust, estate, public or private institution, group, agency, political subdivision of this state, any other state or political subdivision or agency thereof, and any legal successor, representative, agent or agency of the foregoing.

(35) "Personal supervision" means supervision such that the supervisor is physically present at the facility and in such proximity that contact can be maintained and immediate assistance given as required.

(36) "Personnel monitoring equipment" means devices (e.g., film badges, pocket dosimeters, and thermoluminescent dosimeters) designed to be worn or carried by an individual for the purpose of estimating the dose received by the individual.

(37) "Pharmacist" means an individual licensed by this state to compound and dispense drugs, and poisons.

(38) "Physician" means an individual licensed by this state to dispense drugs in the practice of medicine.

(39) "Practitioner" means an individual licensed by the state in the practice of a healing art (i.e., physician, dentist, podiatrist, chiropractor, etc.).

(40) "Rad" means the special unit of absorbed dose. One rad equals one hundredth of a joule per kilogram of material; for example, if tissue is the material of interest, then 1 rad equals 100 ergs per gram of tissue.

(41) "Radiation" means ionizing radiation, i.e., gamma rays and x-rays, alpha and beta particles, high speed electrons, and other nuclear particles.

(42) "Radiation area" means any area, accessible to individuals, in which there exists radiation at such levels that a major portion of the body could receive in any one hour a dose in excess of 5 millirems, or in any 5 consecutive days a dose in excess of 100 millirems.

(43) "Radiation machine" means any device capable of producing ionizing radiation except those which produce radiation only from radioactive material.

(44) "Radiation safety officer" means one who has the knowledge and responsibility to apply appropriate radiation protection regulations.

(45) "Radiation source." See "Source of radiation."

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

(47) "Radioactivity" means the transformation of unstable atomic nuclei by the emission of radiation.

(48) "Registrable item" means any radiation machine except those exempted by RCW 70.98.180 or exempted by the department pursuant to the authority of RCW 70.98.080.

(49) "Registrant" means any person who owns or possesses and administratively controls an x-ray system and is required by the provisions in chapters 402-12 and 402-16 WAC to register with this department.

(50) "Registration" means registration with the department in accordance with the regulations adopted by the department.

(51) "Regulations of the U.S. Department of Transportation" means the regulations in 49 CFR Parts 170-189, 14 CFR Part 103, and 46 CFR Part 146.

(52) "Rem" means a measure of the dose of any radiation to body tissue in terms of its estimated biological effect relative to a dose received from an exposure to one roentgen (R) of x-rays. (One millirem (mrem) = 0.001 rem.) For the purpose of these regulations, any of the following is considered to be equivalent to a dose of one rem:

- (a) An exposure of 1 R of x, or gamma radiation;
- (b) A dose of 1 rad due to x, gamma, or beta radiation;
- (c) A dose of 0.05 rad due to particles heavier than protons and with sufficient energy to reach the lens of the eye;
- (d) A dose of 0.1 rad due to neutrons or high energy protons.\*

NOTE:

\*If it is more convenient to measure the neutron flux, or equivalent, than to determine the neutron absorbed dose in rads, one rem of neutron radiation may, for purposes of these regulations, be assumed to be equivalent to 14 million neutrons per square centimeter incident upon the body; or, if there exists sufficient information to estimate with reasonable accuracy the approximate distribution in energy of the neutrons, the incident number of neutrons per square centimeter equivalent to one rem may be estimated from the following table:

Neutron Flux Dose Equivalents

Neutron energy (MeV)	Number of neutrons per square centimeter for a dose equivalent of 1 rem (neutrons/cm <sup>2</sup> )	Average flux density to deliver 100 millirems in 40 hours (neutrons/cm <sup>2</sup> per second)
Thermal	970 x 10 <sup>6</sup>	670
0.0001	720 x 10 <sup>6</sup>	500
0.005	820 x 10 <sup>6</sup>	570
0.02	400 x 10 <sup>6</sup>	280
0.1	120 x 10 <sup>6</sup>	80
0.5	43 x 10 <sup>6</sup>	30
1.0	26 x 10 <sup>6</sup>	18
2.5	29 x 10 <sup>6</sup>	20
5.0	26 x 10 <sup>6</sup>	18
7.5	24 x 10 <sup>6</sup>	17
10.0	24 x 10 <sup>6</sup>	17
10 to 30	14 x 10 <sup>6</sup>	10

(53) "Research and development" means: (a) Theoretical analysis, exploration, or experimentation; or (b) the extension of investigative findings and theories of a scientific or technical nature into practical application for experimental and demonstration purposes, including 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 human beings.

(54) "Restricted area" (controlled area) means any area the access to which is controlled by the licensee or

registrant for purposes of protection of individuals from exposure to radiation and radioactive material. "Restricted area" shall not include any areas used for residential quarters, although a separate room or rooms in a residential building may be set apart as a restricted area.

(55) "Roentgen" (R) means the special unit of exposure. One roentgen equals 2.58 x 10<sup>4</sup> coulombs/kilogram of air (see "Exposure").

(56) "Sealed source" means radioactive material that is permanently bonded or fixed in a capsule or matrix designed to prevent release and dispersal of the radioactive material under the most severe conditions which are likely to be encountered in normal use and handling.

(57) "Source material" means: (a) Uranium or thorium, or any combination thereof, in any physical or chemical form, or (b) ores which contain by weight one-twentieth of one percent (0.05 percent) or more of (i) uranium, (ii) thorium, or (iii) any combination thereof. Source material does not include special nuclear material.

(58) "Source of radiation" means any radioactive material, or any device or equipment emitting or capable of producing ionizing radiation.

(59) "Source container" means a device in which sealed sources are transported or stored.

(60) "Source material milling" means any activity that results in the production of byproduct material as defined in WAC 402-12-050(6)(b).

(61) "Special form." See WAC 402-12-210.

(62) "Special nuclear material in quantities not sufficient to form a critical mass" means uranium enriched in the isotope U-235 in quantities not exceeding 350 grams of contained U-235; uranium-233 in quantities not exceeding 200 grams; or 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 of the 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:

$$\begin{array}{r}
 \frac{175(\text{grams contained U-235})}{350} + \\
 \frac{50(\text{grams U-233})}{200} + \\
 \frac{50(\text{grams Pu})}{200} < 1
 \end{array}$$

(63) "Survey" means an evaluation of the production, use, release, disposal, and/or presence of sources of radiation under a specific set of conditions to determine actual or potential radiation hazards. When appropriate, such evaluation includes, but is not limited to, tests, physical examinations and measurements of levels of radiation or concentration of radioactive material present.

(64) "Test" means a method for determining the characteristics or condition of sources of radiation or components thereof.

(65) "These regulations" mean all parts of "rules and regulations for radiation protection" of the state of Washington.

(66) "Transport group." See WAC 402-12-200(2).

(67) "Type A quantity." See WAC 402-24-125.

(68) "Type B quantity" means a quantity the aggregate radioactivity of which does not exceed as follows:

Transport Group	Quantity in Curies
I	20
II	20
III	200
IV	200
V	5,000
VI and VII	50,000
Special Form	5,000

(69) "Uncontrolled area." See "unrestricted area."

(70) "United States Department of Energy" means the Department of Energy established by Public Law 95-91, August 4, 1977, 91 Stat. 565, 42 U.S.C. 7101 et seq., to the extent that the department exercises functions formerly vested in the United States Atomic Energy Commission, its chairman, members, officers and components and transferred to the United States Energy Research and Development Administration and to the administrator thereof pursuant to sections 104(b), (c) and (d) of the Energy Reorganization Act of 1974 (Public Law 93-438, October 11, 1974, 88 Stat. 1233 at 1237, effective January 19, 1975) and retransferred to the Secretary of Energy pursuant to section 301(a) of the Department of Energy Organization Act (Public Law 95-91, August 4, 1977, 91 Stat. 565 at 577-578, 42 U.S.C. 7151, effective October 1, 1977.)

(71) "Unrefined and unprocessed ore" means ore in its natural form prior to any processing, such as grinding, roasting, beneficiating, or refining.

(72) "Unrestricted area" (uncontrolled area) means any area access to which is not controlled by the licensee or registrant for purposes of protection of individuals from exposure to radiation and radioactive material, and any area used for residential quarters.

(73) "Waste handling licensees" mean persons licensed to receive and store radioactive wastes prior to disposal and/or persons licensed to dispose of radioactive waste.

(74) "Worker" means an individual engaged in work under a license or registration issued by the department and controlled by a licensee or registrant, but does not include the licensee or registrant. If students of age 18 years or older are subjected routinely to work involving radiation, then the students are considered to be occupational workers. Individuals of less than 18 years of age shall meet the requirements of WAC 402-24-035. [Statutory Authority: Chapter 70.121 RCW. 81-16-031 (Order 1683), § 402-12-050, filed 7/28/81. Statutory Authority: RCW 70.98.050. 81-01-011 (Order 1570), § 402-12-050, filed 12/8/80; Order 1095, § 402-12-050,

filed 2/6/76; Order 708, § 402-12-050, filed 8/24/72; Order 1, § 402-12-050, filed 7/2/71; Order 1, § 402-12-050, filed 1/8/69; Rules (part), filed 10/26/66.]

**Chapter 402-22 WAC  
SPECIFIC LICENSES**

WAC

402-22-040	General requirements for the issuance of specific licenses.
402-22-150	Special requirements for issuance of specific licenses for source material milling.

**WAC 402-22-040 General requirements for the issuance of specific licenses.** A license application will be approved if the department determines that:

(1) The applicant is qualified by reason of training and experience to use the material in question for the purpose requested in accordance with these regulations in such a manner as to minimize danger to public health and safety or property;

(2) The applicant's proposed equipment, facilities, and procedures are adequate to minimize danger to public health and safety or property;

(3) The issuance of the license will not be inimical to the health and safety of the public; and

(4) The applicant satisfies any applicable special requirements in WAC 402-22-070, 402-22-090, and 402-22-110.

(5) In the case of an application for a license to receive and possess radioactive material for commercial waste disposal by land burial, source material milling, or for the conduct of any other activity which the agency determines will significantly affect the quality of the environment, the department, before commencement of construction of the plant or facility in which the activity will be conducted, has concluded, after independently weighing the environmental, economic, technical and other benefits against environmental costs and considering available alternatives, that the action called for is the issuance of the proposed license, with any appropriate conditions to protect environmental values. Commencement of construction prior to such conclusion shall be grounds for denial of a license to receive and possess radioactive material in such plant or facility. As used in this paragraph the term "commencement of construction" means any clearing of land, excavation, or other substantial action that would adversely affect the environment of a site. The term does not mean site exploration, necessary borings to determine foundation conditions, or other preconstruction monitoring or testing to establish background information related to the suitability of the site or the protection of environmental values.

**(6) Financial surety arrangements.**

(a) Pursuant to chapter 70.121 RCW, and except as otherwise provided, financial surety arrangements for site reclamation and long-term surveillance and control which may consist of surety bonds, cash deposits, certificates of deposit, deposits of government securities, irrevocable letters or lines of credit, or any combination of

the above for source material milling operations shall be established to ensure the protection of the public health and safety in the event of abandonment, default, or other inability of the licensee to meet the requirements of the act and these regulations.

(i) The amount of funds to be ensured by such surety arrangements shall be based on agency-approved cost estimates.

(ii) Self-insurance, or any arrangement which essentially constitutes self-insurance (e.g., a contract with a state or federal agency), will not satisfy the surety requirement since this provides no additional assurance other than that which already exists through license requirements.

(b) The arrangements required in WAC 402-22-040(6)(a) shall be established prior to commencement of operations to assure that sufficient funds will be available to carry out the decontamination and decommissioning of the facility.

(c) Amendments to licenses in effect on the effective date of this regulation may be issued providing that the required surety arrangements are established within ninety days after the effective date of WAC 402-22-040(6).

(d) For source material milling operations, the amount of funds to be ensured by such surety arrangements shall be based on agency-approved cost estimates in an approved plan for (i) decontamination and decommissioning of mill buildings and the milling site to levels which would allow unrestricted use of these areas upon decommissioning, and (ii) the reclamation of tailings and/or waste disposal areas in accordance with the technical criteria delineated in WAC 402-52-100. The licensee shall submit this plan in conjunction with an environmental report that addresses the expected environmental impacts of the milling operation, decommissioning and tailings reclamation, and evaluates alternatives for mitigating these impacts. In addition, the surety shall cover the payment of the charge for long-term surveillance and control required by the agency. In establishing specific surety arrangements, the licensee's cost estimates shall take into account total costs that would be incurred if an independent contractor were hired to perform the decommissioning and reclamation work. In order to avoid unnecessary duplication and expense, the agency may accept financial sureties that have been consolidated with financial or surety arrangements established to meet requirements of other federal or state agencies and/or local governing bodies for such decommissioning, decontamination, reclamation, and long-term site surveillance, provided such arrangements are considered adequate to satisfy these requirements and that portion of the surety which covers the decommissioning and reclamation of the mill, mill tailings site and associated areas, and the long-term funding charge are clearly identified. The licensee's surety mechanism will be reviewed annually by the agency to assure that sufficient funds will be available for completion of the reclamation plan if the work had to be performed by an independent contractor. The amount of surety liability

should be adjusted to recognize any increases or decreases resulting from inflation, changes in engineering plans, activities performed, and any other conditions affecting costs. Regardless of whether reclamation is phased through the life of the operation or takes place at the end of operations, an appropriate portion of surety liability shall be retained until final compliance with the reclamation plan is determined. This will yield a surety that is at least sufficient at all times to cover the costs of decommissioning and reclamation of the areas that are expected to be disturbed before the next license renewal. The term of the surety mechanism must be open ended, unless it can be demonstrated that another arrangement would provide an equivalent level of assurance. This assurance could be provided with a surety instrument which is written for a specified period of time (e.g., five years) yet which must be automatically renewed unless the surety notifies the beneficiary (the state regulatory agency) and the principal (the licensee) some reasonable time (e.g., ninety days) prior to the renewal date of their intention not to renew. In such a situation the surety requirement still exists and the licensee would be required to submit an acceptable replacement surety within a brief period of time to allow at least sixty days for the regulatory agency to collect.

(7) Long-term care requirements. Pursuant to chapter 70.121 RCW, and as otherwise provided in WAC 402-22-070(6)(d), a long-term care trust fund shall be established by source material milling licensees prior to the issuance of the license.

**(8) Continued surveillance requirements for source material mills.**

(a) The final disposition of tailings or wastes at source material milling sites should be such that the need for active maintenance is not necessary to preserve isolation. As a minimum, annual site inspections shall be conducted by the government agency retaining ultimate custody of the site where tailings, or wastes are stored to confirm the integrity of the stabilized tailings, or waste systems and to determine the need, if any, for maintenance and/or monitoring and/or environmental sampling. Results of the inspection shall be reported to the U.S. NRC within sixty days following each inspection. The U.S. NRC may require more frequent site inspections, if, on the basis of a site-specific evaluation, such a need appears necessary due to the features of a particular tailings or waste disposal system.

(b) A minimum charge of \$250,000 (1978 dollars) accrued as specified in WAC 402-22-070(6)(d) to cover the costs of long-term surveillance shall be paid by each mill operator to the agency prior to the termination of a uranium or thorium mill license. If site surveillance or control requirements at a particular site are determined, on the basis of a site-specific evaluation, to be significantly greater than those specified in WAC 402-22-040(8)(a) (e.g., if fencing is determined to be necessary) variance in funding requirements may be specified by the department. The total charge to cover the costs of long-term surveillance shall be such that, with an assumed one percent annual real interest rate, the collected funds will yield interest in an amount sufficient to

cover the annual costs of site surveillance. The charge will be adjusted annually prior to actual payments to recognize inflation. The inflation rate to be used is that indicated by the change in the consumer price index published by the United States Department of Labor, Bureau of Labor Statistics. Contributions by a licensee to the long-term care trust fund pursuant to chapter 70.121 RCW shall be transferred to cover the costs assessed under this criterion. [Statutory Authority: Chapter 70.121 RCW. 81-16-031 (Order 1683), § 402-22-040, filed 7/28/81. Statutory Authority: RCW 70.98.080. 79-12-073 (Order 1459), § 402-22-040, filed 11/30/79, effective 1/1/80. Formerly WAC 402-20-060.]

**WAC 402-22-150 Special requirements for issuance of specific licenses for source material milling.** In addition to the requirements set forth in WAC 402-22-040, a specific license for source material milling will be issued if the applicant submits to the department a satisfactory application as described herein and meets the other conditions specified below:

(1) An application for a license to receive title to, receive, possess, and use source material for milling or by-product material as defined in WAC 402-12-050(6) shall address the following:

(a) Description of the proposed project or action.

(b) Area/site characteristics including geology, topography, hydrology and meteorology.

(c) Radiological and nonradiological impacts of the proposed project or action, including waterway and groundwater impacts.

(d) Environmental effects of accidents.

(e) Tailings disposal and decommissioning.

(f) Site and project alternatives.

(2) Pursuant to WAC 402-22-040(5) the applicant shall not commence construction of the project until the department has weighed the environmental, economic, technical, and other benefits against the environmental costs and has concluded that the issuance of the license is appropriate.

(3) Prior to issuance of a license, a public hearing shall be held. The scope shall extend to the question of license issuance and the adequacy of the reclamation, disposal, decommissioning, and decontamination plans.

(4) At least one full year prior to any major site construction, a preoperational monitoring program shall be conducted to provide complete baseline data on a milling site and its environs. Throughout the construction and operating phases of the mill, an operational monitoring program shall be conducted to measure or evaluate compliance with applicable standards and regulations; to evaluate performance of control systems and procedures; to evaluate environmental impacts of operation; and to detect potential long-term effects.

(5) Prior to issuance of the license, the mill operator shall establish financial surety arrangements consistent with the requirements of WAC 402-22-040(6).

(6) The applicant shall provide procedures describing the means employed to meet the following requirements during the operational phase of any project.

(a) Milling operations shall be conducted so that all effluent releases are reduced to as low as is reasonably achievable below the limits of chapter 402-24 WAC.

(b) The mill operator shall conduct at least daily inspection of any tailings or waste retention systems. Records of such inspections shall be maintained for review by the agency.

(c) The mill operator shall immediately notify the agency of the following:

(i) Any failure in a tailings or waste retention system which results in a release of tailings or waste into unrestricted areas, and

(ii) any unusual conditions (conditions not contemplated in the design of the retention system) which if not corrected could lead to failure of the system and result in a release of tailings or waste into unrestricted areas.

(6) An application for a license to own, receive, possess and use byproduct material as defined in WAC 402-12-050(6)(b) shall contain proposed specifications relating to the emissions control and disposition of the byproduct material to achieve the requirements and objectives set forth in the criteria listed in WAC 402-52-100. [Statutory Authority: Chapter 70.121 RCW. 81-16-031 (Order 1683), § 402-22-150, filed 7/28/81.]

#### Chapter 402-52 WAC

#### URANIUM AND/OR THORIUM MILL OPERATION AND STABILIZATION OF MILL TAILING PILES

##### WAC

402-52-010	Repealed.
402-52-015	Repealed.
402-52-020	Repealed.
402-52-025	Repealed.
402-52-100	Criteria related to disposition of uranium mill tailings or wastes.
402-52-200	Continuing dose assessment.

#### DISPOSITION OF SECTIONS FORMERLY CODIFIED IN THIS CHAPTER

402-52-010	Uranium and thorium mill tailing piles and ponds—Control. [Statutory Authority: RCW 70.98.080. 79-12-073 (Order 1459), § 402-52-010, filed 11/30/79, effective 1/1/80; Order 1095, § 402-52-010, filed 2/6/76.] Repealed by 81-16-031 (Order 1683), filed 7/28/81. Statutory Authority: Chapter 70.121 RCW.
402-52-015	Proposed tailing disposal facilities. [Statutory Authority: RCW 70.98.080. 79-12-073 (Order 1459), § 402-52-015, filed 11/30/79, effective 1/1/80.] Repealed by 81-16-031 (Order 1683), filed 7/28/81. Statutory Authority: Chapter 70.121 RCW.
402-52-020	Inactive mills—Stabilization procedures. [Statutory Authority: RCW 70.98.080. 79-12-073 (Order 1459), § 402-52-020, filed 11/30/79, effective 1/1/80; Order 1095, § 402-52-020, filed 2/6/76.] Repealed by 81-16-031 (Order 1683), filed 7/28/81. Statutory Authority: Chapter 70.121 RCW.
402-52-025	Milling operations. [Statutory Authority: RCW 70.98.080. 79-12-073 (Order 1459), § 402-52-025, filed 11/30/79, effective 1/1/80.] Repealed by 81-16-031 (Order 1683), filed 7/28/81. Statutory Authority: Chapter 70.121 RCW.

**WAC 402-52-010 Repealed.** See Disposition Table at beginning of this chapter.

**WAC 402-52-015 Repealed.** See Disposition Table at beginning of this chapter.

**WAC 402-52-020 Repealed.** See Disposition Table at beginning of this chapter.

**WAC 402-52-025 Repealed.** See Disposition Table at beginning of this chapter.

**WAC 402-52-100 Criteria related to disposition of uranium mill tailings or wastes.** As used in this section, the term "as low as reasonably achievable" has the same meaning as in WAC 402-10-010. The term byproduct material has the same meaning as WAC 402-12-050(6)(b).

As required by WAC 402-22-150(6), each applicant for a license to possess and use source material in conjunction with uranium or thorium milling, or byproduct material at sites formerly associated with such milling, is required to include in a license application proposed specifications relating to the milling operation and the disposition of tailings or waste resulting from such milling activities. This section establishes criteria relating to the siting, operation, decontamination, decommissioning, reclamation of mills and tailings or waste systems and sites at which such mills and systems are located and site and byproduct material ownership. Applications must clearly demonstrate how these criteria have been addressed. The specifications shall be developed considering the expected full capacity of tailings or waste systems and the lifetime of mill operations. Where later expansions of systems or operations may be likely, the amendability of the disposal system to accommodate increased capacities without degradation in long-term stability and other performance factors shall be evaluated.

(1) Criterion 1 – In selecting among alternative tailings disposal sites or judging the adequacy of existing tailings sites, the following site features which would assure meeting the broad objective of isolating the tailings and associated contaminants from man and the environment in the short term and for thousands of years without ongoing active maintenance shall be considered:

- (a) Remoteness from populated areas;
- (b) Hydrogeologic and other environmental conditions conducive to continued immobilization and isolation of contaminants from usable groundwater sources; and
- (c) Potential for minimizing erosion, disturbance, and dispersion by natural forces over the long term.

In the selection of disposal sites, primary emphasis shall be given to isolation of tailings or wastes, a matter having long-term impacts, as opposed to consideration only of short-term convenience or benefits, such as minimization of transportation or land acquisition costs. While isolation of tailings will be a function of both site characteristics and engineering design, overriding consideration shall be given to siting features given the long-term nature of the tailings hazards.

Tailings shall be disposed in a manner such that no active maintenance is required to preserve the condition of the site.

(2) Criterion 2 – To avoid proliferation of small waste disposal sites, byproduct material from in-situ extraction operations, such as residues from solution evaporation or contaminated control processes, and wastes from small remote above ground extraction operations shall preferably be disposed at existing large mill tailings disposal sites; unless, considering the nature of the wastes, such as their volume and specific activity and the costs and environmental impacts of transporting the wastes to a large disposal site, such offsite disposal is demonstrated to be impracticable or the advantage of onsite burial clearly outweigh the benefits of reducing the perpetual surveillance obligations.

(3) Criterion 3 – The "prime option" for disposal of tailings is placement below grade, either in mines or specially excavated pits (that is, when the need for any specially constructed retention structure is eliminated). The evaluation of alternative sites and disposal methods performed by mill operators in support of their proposed tailings disposal program (provided in applicants' environmental reports) shall reflect serious consideration of this disposal mode. In some instances, below-grade disposal may not be the most environmentally sound approach, such as might be the case if a high quality groundwater formation is relatively close to the surface or not very well isolated by overlying soils and rock. Also, geologic and topographic conditions might make full, below-grade burial impracticable; for example, bedrock may be sufficiently near the surface that blasting would be required to excavate a disposal pit at excessive cost, and more suitable alternate sites are not available. Where full below-grade burial is not practicable, the size of retention structures, and size and steepness of slopes of associated exposed embankments, shall be minimized by excavation to the maximum extent reasonably achievable or appropriate, given the geologic and hydrogeologic conditions at a site. In these cases, it must be demonstrated that an above-grade disposal program will provide reasonably equivalent isolation of the tailings from natural erosional forces.

(4) Criterion 4 – The following site and design criteria shall be adhered to whether tailings or wastes are disposed of above or below grade:

(a) Upstream rainfall catchment areas must be minimized to decrease erosion potential and the size of the maximum possible flood which could erode or wash out sections of the tailings disposal area.

(b) Topographic features shall provide good wind protection.

(c) Embankment and cover slopes shall be relatively flat after final stabilization to minimize erosion potential and to provide conservative factors of safety assuring long-term stability. The broad objective should be to contour final slopes to grades which are as close as possible to those which would be provided if tailings were disposed of below grade; this could, for example, lead to slopes of about 10 horizontal to 1 vertical (10h:1v) or less steep. In general, slopes should not be steeper than about 5h:1v. Where steeper slopes are proposed, reasons why a slope less steep than 5h:1v would be impracticable

should be provided, and compensating factors and conditions which make such slopes acceptable should be identified.

(d) A fully self-sustaining vegetative cover shall be established or rock cover employed to reduce wind and water erosion to negligible levels.

Where a full vegetative cover is not likely to be self-sustaining due to climatic conditions, such as in semi-arid and arid regions, rock cover shall be employed on slopes of the impoundment system.

The following factors shall be considered in establishing the final rock cover design to avoid displacement of rock particles by human and animal traffic or by natural processes, and to preclude undercutting and piping:

(i) Shape, size, composition, gradation of rock particles (excepting bedding material, average particle size shall be at least cobble size or greater);

(ii) Rock cover thickness and zoning of particles by size; and

(iii) Steepness of underlying slopes.

Individual rock fragments shall be dense, sound, and resistant to abrasion, and free from defects that would tend to unduly increase their destruction by water and frost actions. Weak, friable, or laminated aggregate shall not be used. Shale, rock laminated with shale, and cherts shall not be used.

Rock covering of slopes may not be required where top covers are on the order of 10 meters or greater; impoundment slopes are on the order of 10h:1v or less; bulk cover materials have inherently favorable erosion resistance characteristics; and there is negligible drainage catchment area upstream of the pile, and there is good wind protection as described in points (a) and (b) of this criterion.

Impoundment surfaces shall be contoured to avoid areas of concentrated surface runoff or abrupt or sharp changes in slope gradient. In addition to rock cover on slopes, areas toward which surface runoff might be directed shall be well protected with substantial rock cover (riprap). In addition to providing for stability of the impoundment systems itself, the overall stability, erosion potential, and geomorphology of surrounding terrain shall be evaluated to assure that there are no processes, such as gully erosion, which would lead to impoundment instability.

(e) The impoundment shall not be located near a capable fault that could cause a maximum credible earthquake larger than that which the impoundment could reasonably be expected to withstand. As used in this criterion, the term "capable fault" has the same meaning as defined in Section III (g) of Appendix A of 10 CFR Part 100. The term "maximum credible earthquake" means that earthquake which would cause the maximum vibratory ground motion based upon an evaluation of earthquake potential considering the regional and local geology and seismology and specific characteristics of local subsurface material.

(f) The impoundment, where feasible, should be designed to incorporate features which will promote deposition of suspended particles. For example, design

features which promote deposition of sediment suspended in any runoff which flows into the impoundment area might be utilized; the object of such a design feature would be to enhance the thickness of cover over time.

(5) Criterion 5 - Steps shall be taken to reduce seepage of toxic materials into groundwater to the maximum extent reasonably achievable. Any seepage which does occur shall not result in deterioration of groundwater quality. Any existing groundwater supplies shall be protected from any deterioration in their current or potential use.

The following steps shall be considered to accomplish this criterion:

(a) Installation of low permeability bottom liners (where synthetic liners are used, a leakage detection system shall be installed immediately below the liner to ensure major failures are detected if they occur. This is in addition to the groundwater monitoring program conducted as provided in Criterion 7 WAC 402-52-100(7). Where clay liners are proposed or relatively thin in-situ clay soils are to be relied upon for seepage control, tests shall be conducted with representative tailings solutions and clay materials to confirm that no significant deterioration of permeability or stability properties will occur with continuous exposure of clay to tailings solutions. Tests shall be run for a sufficient period of time to reveal any effects if they are going to occur (in some cases, deterioration has been observed to occur rather rapidly after about nine months of exposure)).

(b) Mill process design which provides the maximum practicable recycle of solutions and conservation of water to reduce the net input of liquid to the tailings impoundment.

(c) Dewatering of tailings by process devices and/or in-situ drainage system. At new sites, tailings shall be dewatered by a drainage system installed at the bottom of the impoundment to lower the phreatic surface and reduce the driving head for seepage, unless tests show tailings are not amenable to such a system. Where in-situ dewatering is to be conducted, the impoundment bottom shall be graded to assure that the drains are at a low point. The drains shall be protected by suitable filter materials to assure that drains remain free running. The drainage system shall also be adequately sized to assure good drainage.

(d) Neutralization to prevent movement of toxic substances.

Where groundwater is affected at an existing site due to seepage, action shall be taken to alleviate conditions that lead to excessive seepage and restore groundwater to its quality before milling operations began to the maximum extent practicable. The specific seepage control and groundwater protection method, or combination of methods, to be used must be worked out on a site-specific basis. Technical specifications shall be prepared to control installation of seepage control systems. A quality assurance, testing, and inspection program, which includes supervision by a qualified engineer or geologist, shall be established to assure that specification is met.

While the primary method of protecting groundwater shall be isolation of tailings and tailings solutions, disposal involving contact with groundwater will be considered provided supporting tests and analysis are presented demonstrating that the proposed disposal and treatment methods will not degrade groundwater from current or potential uses.

Furthermore, steps shall be taken during stockpiling of ore to minimize penetration of radionuclides into underlying soils; suitable methods include lining and/or compaction of ore storage areas.

In support of a tailings disposal system proposal, the applicant/operator shall supply information concerning the following:

(e) The chemical and radioactive characteristics of the waste solutions.

(f) The characteristics of the underlying soil and geologic formations particularly the extent to which they will control transport of contaminants and solutions. This shall include detailed information concerning extent, thickness, uniformity, shape, and orientation of underlying strata. Hydraulic gradients and conductivities of the various formations shall be determined.

This information shall be gathered by borings and field survey methods taken within the proposed impoundment area and in surrounding areas where contaminants might migrate to usable groundwater. The information gathered on boreholes shall include both geologic and geophysical logs in sufficient number and degree of sophistication to allow determining significant discontinuities, fractures, and channeled deposits which are of high hydraulic conductivity. If field survey methods are used, they should be in addition to and calibrated with borehole logging. Hydrologic parameters such as permeability shall not be determined on the basis of laboratory analysis of samples alone; a sufficient amount of field testing (e.g., pump tests) shall be conducted to assure actual field properties are adequately understood. Testing shall be conducted to allow estimating chemisorption attenuation properties of underlying soil and rock.

(g) Location, extent, quality, and capacity of any groundwater at and near the site.

(6) Criterion 6 – Sufficient earth cover, but not less than three meters, shall be placed over tailings or wastes at the end of milling operations to result in a calculated reduction in surface exhalation of radon emanating from the tailings or wastes to less than two picocuries per square meter per second. In computing required tailings cover thicknesses, moisture in soils in excess of amounts found normally in similar soils in similar circumstances shall not be considered. Direct gamma exposure from the tailings or wastes should be reduced to background levels. The effects of any thin synthetic layer shall not be taken into account in determining the calculated radon exhalation level. If nonsoil materials are proposed to reduce tailings covers to less than three meters, it must be demonstrated that such materials will not crack or degrade by differential settlement, weathering, or other mechanism over long term time intervals. Near surface

materials (i.e., within the top three meters) shall not include mine waste or rock that contains elevated levels of radium; soils used for near surface cover must be essentially the same, as far as radioactivity is concerned, as that of surrounding soils.

(7) Criterion 7 – Milling operations shall be conducted so that all airborne effluent releases are reduced to as low as is reasonably achievable. The primary means of accomplishing this shall be by means of emission controls. Institutional controls, such as extending the site boundary and exclusion area, may be employed to ensure that offsite exposure limits are met, but only after all practicable measures have been taken to control emissions at the source. Notwithstanding the existence of individual dose standards, strict control of emissions is necessary to assure that population exposures are reduced to the maximum extent reasonably achievable and to avoid site contamination. The greatest potential sources of offsite radiation exposure (aside from radon exposure) are dusting from dry surfaces of the tailings disposal area not covered by tailings solution and emissions from yellowcake drying and packaging operations. Checks shall be made and logged hourly of all parameters (e.g., differential pressure and scrubber water flow rate) which determine the efficiency of yellowcake stack emission control equipment operation. It shall be determined whether or not conditions are within a range prescribed to ensure that the equipment is operating consistently near peak efficiency; corrective action shall be taken when performance is outside of prescribed ranges. Effluent control devices shall be operative at all times during drying and packaging operations and whenever air is exhausting from the yellowcake stack.

Drying and packaging operations shall terminate when controls are inoperative. When checks indicate the equipment is not operating within the range prescribed for peak efficiency, actions shall be taken to restore parameters to the prescribed range. When this cannot be done without shutdown and repairs, drying and packaging operations shall cease as soon as practicable.

Operations may not be re-started after cessation due to off-normal performance until needed corrective actions have been identified and implemented. All such cessations, corrective actions, and re-starts shall be reported to the agency in writing, within 10 days of the subsequent re-start.

To control dusting from tailings, that portion not covered by standing liquids shall be wetted or chemically stabilized to prevent or minimize blowing and dusting to the maximum extent reasonably achievable. This requirement may be relaxed if tailings are effectively sheltered from wind, such as may be the case where they are disposed of below grade and the tailings surface is not exposed to wind. Consideration shall be given in planning tailings disposal programs to methods which would allow phased covering and reclamation of tailings impoundments since this will help in controlling particulate and radon emissions during operation. To control dustings from diffuse sources, such as tailings and ore pads where automatic controls do not apply, operators

shall develop written operating procedures specifying the methods of control which will be utilized.

(8) Criterion 8 – These criteria relating to ownership of tailings and their disposal sites become effective on November 8, 1981, and apply to all licenses terminated, issued, or renewed after that date.

Any uranium or thorium milling license or tailings license shall contain such terms and conditions as the United States NRC determines necessary to assure that prior to termination of the license, the licensee will comply with ownership requirements of this criterion for sites used for tailings disposal.

Title to the byproduct material licensed pursuant to WAC 402-22-150 and land, including any interests therein (other than land owned by the United States or by a state) which is used for the disposal of any such byproduct material, or is essential to ensure the long term stability of such disposal site, shall be transferred to the United States or the state. In view of the fact that physical isolation must be the primary means of long term control, and government land ownership is a desirable supplementary measure, ownership of certain severable subsurface interests (for example, mineral rights) may be determined to be unnecessary to protect the public health and safety and the environment. In any case, however, the applicant/operator must demonstrate a serious effort to obtain such subsurface rights, and must, in the event that certain rights cannot be obtained, provide notification in local public land records of the fact that the land is being used for the disposal of radioactive material and is subject to either a United States NRC general or specific license prohibiting the disruption and disturbance of the tailings. In some rare cases, such as may occur with deep burial where no ongoing site surveillance will be required, surface land ownership transfer requirements may be waived. For licenses issued before November 8, 1981, the United States Nuclear Regulatory Commission may take into account the status of the ownership of such land, and interests therein, and the ability of a licensee to transfer title and custody thereof to the United States or the state. [Statutory Authority: Chapter 70.121 RCW. 81-16-031 (Order 1683), § 402-52-100, filed 7/28/81.]

**WAC 402-52-200 Continuing dose assessment.** Each uranium or thorium milling operation shall submit in writing to the department by May 1 and November 1 of each year, reports specifying the quantities of each of the principle radionuclides released to unrestricted areas in liquid and in gaseous effluent during the previous six months of operations. This data shall be reported in a manner that will permit the department to confirm the potential annual radiation doses to the public. All data from the radiological and nonradiological environmental monitoring program will also be submitted for the same time period and frequency as specified above. The data shall be reported in a manner which will allow the department to confirm the potential annual radiation doses to the public. In addition, the report due each May 1 shall include a dose assessment to assure compliance with 40 CFR 190 Environmental Radiation Protection

Standards for Nuclear Power Operation and an annual land use survey to include but not be limited to water supply information, location and number of occupants, time spent at each location by occupants, amount and type of locally grown stored feed and amount of pasture consumed by local livestock. [Statutory Authority: Chapter 70.121 RCW. 81-16-031 (Order 1683), § 402-52-200, filed 7/28/81.]

## Title 410 WAC RECIPROCITY COMMISSION

### Chapters

**410-20** Vehicle reciprocity.

### Chapter 410-20 WAC VEHICLE RECIPROCITY

#### WAC

410-20-010	Application.
410-20-020	Definitions.
410-20-030	Basic policy defined.
410-20-040	Restrictions and conditions.
410-20-050	Administration.
410-20-060	Interpretation.
410-20-070	Regular meeting dates.

**WAC 410-20-010 Application.** In the absence of a written agreement between the state of Washington and another jurisdiction these rules shall apply to the operation of vehicles which are not licensed or registered in this state. [Statutory Authority: RCW 46.85.030. 81-02-030 (Order WRC-2), § 410-20-010, filed 1/5/81.]

**WAC 410-20-020 Definitions.** (1) "Resident" means any person who

- (a) resides in this state for a period in excess of six months in any continuous twelve month period; or
- (b) becomes a registered voter in this state; or
- (c) places children in a public school without paying nonresident tuition fees; or
- (d) receives benefits under one of the Washington public assistance programs; or
- (e) declares himself to be a resident for the purpose to obtain a state license or tuition fees at resident rates; or
- (f) is permanently employed in the state.

(2) "Military personnel" means active members of the United States Army, Navy, Air Force, Marine Corps, Coast Guard, commissioned officers of the Public Health Service, and members of foreign military organizations assigned to this state on official duty.

(3) "Jurisdiction" means a state, territory, or possession of the United States, the District of Columbia, or a state or province of a country. [Statutory Authority: RCW 46.85.030. 81-02-030 (Order WRC-2), § 410-20-020, filed 1/5/81.]

**WAC 410-20-030 Basic policy defined.** Chapter 46.85 RCW authorizes the Washington reciprocity commission to enter into agreements with other jurisdictions