



To: Members of the State Board of Health

From: James H. Grice, Radiation Program Manager, Hazardous Materials and Waste Management Division  
James S. Jarvis, Regulatory Lead, Hazardous Materials and Waste Management Division

Through: Jennifer T. Opila, Division Director <sup>170</sup>

Date: **May 19, 2021**

Subject: **Rulemaking Hearing** concerning proposed amendments to 6 CCR 1007-1 Part 16, Radiation safety requirements for well logging and subsurface tracer studies and Part 19, Licenses and radiation safety requirements for irradiators.

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The radiation program is proposing changes to the Part 16 and Part 19 regulations primarily to conform to the 2020 federal rule changes of the U.S. Nuclear Regulatory Commission (NRC) in 10 CFR Part 36, and 10 CFR Part 39. As an Agreement State program, and in accordance with state statute, Colorado is required to adopt rules which are compatible and consistent with the applicable federal regulations and is therefore the primary driver for the proposed rule changes. In addition to the federally driven changes minor technical changes to the rules are also proposed for consistency with other recent radiation regulation changes.

The proposed changes to these rules will eliminate a reference that specifies use of personnel dosimetry systems that meet a certain specifications for processing. The intent of the rule change is to provide flexibility to licensees by allowing use of newer dosimetry systems that do not require offsite "processing" and instead can be read directly by a licensee facility. This proposed change is expected to allow more flexibility in the types of dosimetry that a facility can use to monitor employee radiation exposure. Additionally, the use of such instant read dosimetry systems will provide a more rapid indication of occupational dose following handling of higher risk sources and other radioactive materials.

The federal rulemaking process was conducted using a direct final rule procedure since the rule was deemed to be non-controversial. For the Part 16 and 19 stakeholder process, no feedback or comments were received during the comment period as a result of the proposed changes.

Since the rule changes impact only a few areas of the rule, only those impacted sections are included in the proposed draft. New text appears as red bold text and deleted text shown as strikethrough text. **Consistent with Board practice, items highlighted in yellow have been modified since the request for rulemaking.**

The Radiation Program requests that the Board of Health **adopt the rules as proposed.**

STATEMENT OF BASIS AND PURPOSE  
AND SPECIFIC STATUTORY AUTHORITY  
for Amendments to

6 CCR 1007-1,

Part 16, Radiation safety requirements for well logging and subsurface tracer studies  
Part 19, Licenses and radiation safety requirements for irradiators

Basis and Purpose.

Current regulations require the use of individual monitoring devices (personnel dosimetry) that is processed and evaluated by an accredited National Voluntary Laboratory Accreditation Program (NVLAP) processor. This limits the types of personnel dosimeters that can be used and effectively prohibits the use of dosimetry technologies that do not require processing by an accredited NVLAP facility.

The proposed Part 16 and 19 amendments revise the language, consistent with federal rule, to allow the use of modern personnel dosimetry in irradiator and well logging operations. The types and quantities of radioactive materials used in these industries tend to be of higher risk and have a greater potential for personnel exposure. The modern dosimetry systems permitted under the proposed rule changes typically require electronic communication with the manufacturers systems and thereby providing a level of quality control. This newer technology will allow these industries to obtain a prompt readout following routine activities or during events involving potential high exposures rather than wait for dosimetry processing.

Dosimetry systems that continue to require offsite processing will continue to require processing that is NVLAP accredited in accordance with [Part 4, Section 4.17](#) of the current regulations.

Similar to other recent radiation regulation amendments, changes are also proposed to make technical and formatting updates to the rule for consistency with the Colorado Administrative Procedure Act with regard to documents incorporated by reference.

The specific proposed changes to these rules are outlined for each section below.

Part 16, Section 16.1.5 and Part 19, Section 19.1.5

The revised sections incorporate the updated standard incorporation by reference language, consistent with recently amended radiation control regulations.

Part 16, Section 16.17 and Part 19, Section 19.20

These sections are updated, consistent with recently amended federal regulations to eliminate references to National Voluntary Laboratory Accreditation Program (NVLAP) processing. This change will allow use of dosimetry systems that can be read directly by the licensee facility.

Throughout Part 16 and Part 19

Minor typographical and formatting corrections are made.

Specific Statutory Authority.

Statutes that require or authorize rulemaking:

25-1.5-101(1)(k), 25-1.5-101(1)(l), 25-11-103, 25-11-104, and 25-1-108, C.R.S.

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Is this rulemaking due to a change in state statute?

Yes, the bill number is \_\_\_\_\_. Rules are  authorized  required.

No

Does this rulemaking include proposed rule language that incorporate materials by reference?

Yes  URL

No

Does this rulemaking include proposed rule language to create or modify fines or fees?

Yes

No

Does the proposed rule language create (or increase) a state mandate on local government?

No.

- The proposed rule does not require a local government to perform or increase a specific activity for which the local government will not be reimbursed;
- The proposed rule requires a local government to perform or increase a specific activity because the local government has opted to perform an activity, or;
- The proposed rule reduces or eliminates a state mandate on local government.

REGULATORY ANALYSIS  
6 CCR 1007-1,

Part 16, Radiation safety requirements for well logging and subsurface tracer studies  
Part 19, Licenses and radiation safety requirements for irradiators

1. A description of the classes of persons affected by the proposed rule, including the classes that will bear the costs and the classes that will benefit from the proposed rule.

Group of persons/entities Affected by the Proposed Rule	Size of the Group	Relationship to the Proposed Rule Select category: C/CLG/S/B
Well logging licensees and their employees	7	C / B
Irradiator licensees and their employees	3	C / B
Other stakeholders having an interest in industrial use radiation regulations	255	S / B

While all are stakeholders, groups of persons/entities connect to the rule and the problem being solved by the rule in different ways. To better understand those different relationships, please refer to the following relationship categorization key:

- C = individuals/entities that implement or apply the rule.
- S = individuals/entities that do not implement or apply the rule but are interested in others applying the rule.
- B = the individuals that are ultimately served, including the customers of our customers. These individuals may benefit, be harmed by or be at-risk because of the standard communicated in the rule or the manner in which the rule is implemented.

More than one category may be appropriate for some stakeholders.

2. To the extent practicable, a description of the probable quantitative and qualitative impact of the proposed rule, economic or otherwise, upon affected classes of persons.

Economic outcomes

Summarize the financial costs and benefits, include a description of costs that must be incurred, costs that may be incurred, any Department measures taken to reduce or eliminate these costs, and any financial benefits.

C and B: None. There is no quantitative non-economic impact of the proposed rule change.

There is no quantitative economic benefit to the Department if the rule is amended as proposed. The proposed changes will not impact the inspection or licensing activities of the program for the affected licensees.

Please describe any anticipated financial costs or benefits to these individuals/entities.

C: The use of personnel dosimetry systems that enable a shorter read time would provide an additional radiation monitoring option for licensees and their employees. The proposed change in the rule does not mandate the use of such modern (direct

read) dosimetry systems, but rather permits the use of these devices through regulation, rather than a special approval. Any differences in dosimetry system costs would be for the consideration of the licensees depending upon their business and operational needs, but in the end it would be their choice. A dosimetry system that provides a quicker dose evaluation for employees could be beneficial to licensees in that it would allow employees to return to work sooner, following a potential increased exposure situation. These positive impacts are not easily quantifiable.

S: No financial costs or financial benefits.

B: There are no financial costs. There are some potential financial benefits. As discussed above for those implementing the requirements for dosimetry (e.g., licensees providing services to others), having an additional monitoring option may also be beneficial to the customers of irradiator or well logging licensees. The use of a quick reading dosimetry system would permit the licensee to return to work sooner following potential increased exposure events thereby saving time and limiting work delays. These positive impacts are not easily quantifiable.

#### Non-economic outcomes

Summarize the anticipated favorable and non-favorable non-economic outcomes (short-term and long-term), and, if known, the likelihood of the outcomes for each affected class of persons by the relationship category.

The anticipated favorable non-economic outcome is that the approximately 10 licensees who fall under the requirements of these regulatory parts will have added flexibility in how they monitor the radiation dose of their employees. Although some facilities have requested specific authorization to utilize instant read dosimetry systems through their license, the proposed change will make this dosimetry option available to all licensees who fall under these regulatory parts and without the need for special authorization.

There are believed to be no non-favorable non-economic outcomes as a result of the proposed rule changes.

3. The probable costs to the agency and to any other agency of the implementation and enforcement of the proposed rule and any anticipated effect on state revenues.
  - A. Anticipated CDPHE personal services, operating costs or other expenditures: There are no anticipated costs associated with the proposed changes.
  - B. Anticipated CDPHE Revenues: There are no change in revenues as a result of the proposed changes.
  - C. Anticipated personal services, operating costs or other expenditures by another state agency:
  - D. Anticipated Revenues for another state agency: None.
4. A comparison of the probable costs and benefits of the proposed rule to the probable costs and benefits of inaction.

Along with the costs and benefits discussed above, the proposed revisions:

- Comply with a statutory mandate to promulgate rules.
- Comply with federal or state statutory mandates, federal or state regulations, and department funding obligations.
- Maintain alignment with other states or national standards.
- Implement a Regulatory Efficiency Review (rule review) result
- Improve public and environmental health practice.
- Implement stakeholder feedback.

Advance the following CDPHE Strategic Plan priorities (select all that apply):

<p>1. Reduce Greenhouse Gas (GHG) emissions economy-wide from 125.716 million metric tons of CO<sub>2</sub>e (carbon dioxide equivalent) per year to 119.430 million metric tons of CO<sub>2</sub>e per year by June 30, 2020 and to 113.144 million metric tons of CO<sub>2</sub>e by June 30, 2023.</p> <p><input type="checkbox"/> Contributes to the blueprint for pollution reduction</p> <p><input type="checkbox"/> Reduces carbon dioxide from transportation</p> <p><input type="checkbox"/> Reduces methane emissions from oil and gas industry</p> <p><input type="checkbox"/> Reduces carbon dioxide emissions from electricity sector</p>
<p>2. Reduce ozone from 83 parts per billion (ppb) to 80 ppb by June 30, 2020 and 75 ppb by June 30, 2023.</p> <p><input type="checkbox"/> Reduces volatile organic compounds (VOC) and oxides of nitrogen (NO<sub>x</sub>) from the oil and gas industry.</p> <p><input type="checkbox"/> Supports local agencies and COGCC in oil and gas regulations.</p> <p><input type="checkbox"/> Reduces VOC and NO<sub>x</sub> emissions from non-oil and gas contributors</p>
<p>3. Decrease the number of Colorado adults who have obesity by 2,838 by June 30, 2020 and by 12,207 by June 30, 2023.</p> <p><input type="checkbox"/> Increases the consumption of healthy food and beverages through education, policy, practice and environmental changes.</p> <p><input type="checkbox"/> Increases physical activity by promoting local and state policies to improve active transportation and access to recreation.</p> <p><input type="checkbox"/> Increases the reach of the National Diabetes Prevention Program and Diabetes Self-Management Education and Support by collaborating with the Department of Health Care Policy and Financing.</p>
<p>4. Decrease the number of Colorado children (age 2-4 years) who participate in the WIC Program and have obesity from 2120 to 2115 by June 30, 2020 and to 2100 by June 30, 2023.</p> <p><input type="checkbox"/> Ensures access to breastfeeding-friendly environments.</p>

<p>5. Reverse the downward trend and increase the percent of kindergartners protected against measles, mumps and rubella (MMR) from 87.4% to 90% (1,669 more kids) by June 30, 2020 and increase to 95% by June 30, 2023.</p> <ul style="list-style-type: none"> <li>___ Reverses the downward trend and increase the percent of kindergartners protected against measles, mumps and rubella (MMR) from 87.4% to 90% (1,669 more kids) by June 30, 2020 and increase to 95% by June 30, 2023.</li> <li>___ Performs targeted programming to increase immunization rates.</li> <li>___ Supports legislation and policies that promote complete immunization and exemption data in the Colorado Immunization Information System (CIIS).</li> </ul>
<p>6. Colorado will reduce the suicide death rate by 5% by June 30, 2020 and 15% by June 30, 2023.</p> <ul style="list-style-type: none"> <li>___ Creates a roadmap to address suicide in Colorado.</li> <li>___ Improves youth connections to school, positive peers and caring adults, and promotes healthy behaviors and positive school climate.</li> <li>___ Decreases stigma associated with mental health and suicide, and increases help-seeking behaviors among working-age males, particularly within high-risk industries.</li> <li>___ Saves health care costs by reducing reliance on emergency departments and connects to responsive community-based resources.</li> </ul>
<p>7. The Office of Emergency Preparedness and Response (OEPR) will identify 100% of jurisdictional gaps to inform the required work of the Operational Readiness Review by June 30, 2020.</p> <ul style="list-style-type: none"> <li>___ Conducts a gap assessment.</li> <li>___ Updates existing plans to address identified gaps.</li> <li>___ Develops and conducts various exercises to close gaps.</li> </ul>
<p>8. For each identified threat, increase the competency rating from 0% to 54% for outbreak/incident investigation steps by June 30, 2020 and increase to 92% competency rating by June 30, 2023.</p> <ul style="list-style-type: none"> <li>___ Uses an assessment tool to measure competency for CDPHE's response to an outbreak or environmental incident.</li> <li>___ Works cross-departmentally to update and draft plans to address identified gaps noted in the assessment.</li> <li>___ Conducts exercises to measure and increase performance related to identified gaps in the outbreak or incident response plan.</li> </ul>
<p>9. 100% of new technology applications will be virtually available to customers, anytime and anywhere, by June 20, 2020 and 90 of the existing applications by June 30, 2023.</p> <ul style="list-style-type: none"> <li>___ Implements the CDPHE Digital Transformation Plan.</li> <li>___ Optimizes processes prior to digitizing them.</li> <li>___ Improves data dissemination and interoperability methods and timeliness.</li> </ul>

10. Reduce CDPHE's Scope 1 & 2 Greenhouse Gas emissions (GHG) from 6,561 metric tons (in FY2015) to 5,249 metric tons (20% reduction) by June 30, 2020 and 4,593 tons (30% reduction) by June 30, 2023.

- Reduces emissions from employee commuting  
 Reduces emissions from CDPHE operations

11. Fully implement the roadmap to create and pilot using a budget equity assessment by June 30, 2020 and increase the percent of selected budgets using the equity assessment from 0% to 50% by June 30, 2023.

- Used a budget equity assessment  
 Advance CDPHE Division-level strategic priorities.

The costs and benefits of the proposed rule will not be incurred if inaction was chosen. Costs and benefits of inaction not previously discussed include:

The cost of inaction with failing to implement the proposed change to eliminate references to NVLAP certification will make the rule inconsistent with federal regulations and the national framework for radiation regulation. Inaction will also result in licensed facilities having fewer options with implementing their radiation dosimetry program. Similarly, not implementing the updated provisions pertaining to documents incorporated by reference will potentially make the rule incompatible with the Colorado Administrative Procedure Act.

There are no benefits of inaction.

5. A determination of whether there are less costly methods or less intrusive methods for achieving the purpose of the proposed rule.

Rulemaking is proposed when it is the least costly method or the only statutorily allowable method for achieving the purpose of the statute. The benefits, risks and costs of these proposed revisions were compared to the costs and benefits of other options. The proposed revisions provide the most benefit for the least amount of cost, are the minimum necessary or are the most feasible manner to achieve compliance with statute. By eliminating the reference to NVLAP dosimetry processing in these rules, it will make them more consistent with federal regulation and will also provide additional options to licensees with regard to their dosimetry program and the monitoring of employees.

6. Alternative Rules or Alternatives to Rulemaking Considered and Why Rejected.

No alternatives to this rulemaking were considered. Failure to implement requirements that are consistent with federal rule will potentially make Colorado's Agreement State program incompatible with our NRC agreement. Failure to implement requirements that are consistent with the requirements of the Administrative Procedure Act for documents incorporated by reference may result in the rule being negated or invalidated by the legislature.

7. To the extent practicable, a quantification of the data used in the analysis; the analysis must take into account both short-term and long-term consequences.



The proposed change did not require a data based evaluation or analysis. The proposed change is expected to simplify the requirements and allow additional flexibility for those licensees who must follow and adhere to the requirements of Part 16 and Part 19. The proposed language and approach pertaining to documents incorporated by reference are consistent with information found in other Department rules and regulations.

STAKEHOLDER ENGAGEMENT  
for Amendments to  
6 CCR 1007-1,

Part 16, Radiation safety requirements for well logging and subsurface tracer studies  
Part 19, Licenses and radiation safety requirements for irradiators

State law requires agencies to establish a representative group of participants when considering to adopt or modify new and existing rules. This is commonly referred to as a stakeholder group.

Early Stakeholder Engagement:

The following individuals and/or entities were invited to provide input and included in the development of these proposed rules:

Approximately 265 stakeholders were notified via email of the opportunity to comment on the proposed draft rules, which were posted on the Department website. The stakeholders consist of approximately 10 impacted licensees along with approximately 255 other individuals having an interest in radiation regulations applicable to industrial facilities.

Due to the limited scope and anticipated beneficial impact of the proposed rule changes, no stakeholder meetings were held. No comments were received during the 30 day comment period held December 14, 2020 through January 13, 2021.

Stakeholder Group Notification

The stakeholder group was provided notice of the rulemaking hearing and provided a copy of the proposed rules or the internet location where the rules may be viewed. Notice was provided prior to the date the notice of rulemaking was published in the Colorado Register (typically, the 10<sup>th</sup> of the month following the Request for Rulemaking).

Not applicable. This is a Request for Rulemaking Packet. Notification will occur if the Board of Health sets this matter for rulemaking.

Yes.

Summarize Major Factual and Policy Issues Encountered and the Stakeholder Feedback Received. If there is a lack of consensus regarding the proposed rule, please also identify the Department's efforts to address stakeholder feedback or why the Department was unable to accommodate the request.

No major factual or policy issues were encountered during the stakeholder process. The proposed changes are primarily technical in nature and are made to improve rulemaking efficiency. The proposed changes will help maintain the required consistency with existing federal rule and the Colorado Administrative Procedure Act. No stakeholders provided comments or feedback on the proposed rule changes.

Please identify the determinants of health or other health equity and environmental justice considerations, values or outcomes related to this rulemaking.

Overall, after considering the benefits, risks and costs, the proposed rule:

Select all that apply.

	Improves behavioral health and mental health; or, reduces substance abuse or suicide risk.		Reduces or eliminates health care costs, improves access to health care or the system of care; stabilizes individual participation; or, improves the quality of care for unserved or underserved populations.
	Improves housing, land use, neighborhoods, local infrastructure, community services, built environment, safe physical spaces or transportation.	X	Reduces occupational hazards; improves an individual's ability to secure or maintain employment; or, increases stability in an employer's workforce.
	Improves access to food and healthy food options.	X	Reduces exposure to toxins, pollutants, contaminants or hazardous substances; or ensures the safe application of radioactive material or chemicals.
X	Improves access to public and environmental health information; improves the readability of the rule; or, increases the shared understanding of roles and responsibilities, or what occurs under a rule.		Supports community partnerships; community planning efforts; community needs for data to inform decisions; community needs to evaluate the effectiveness of its efforts and outcomes.
	Increases a child's ability to participate in early education and educational opportunities through prevention efforts that increase protective factors and decrease risk factors, or stabilizes individual participation in the opportunity.		Considers the value of different lived experiences and the increased opportunity to be effective when services are culturally responsive.
	Monitors, diagnoses and investigates health problems, and health or environmental hazards in the community.		Ensures a competent public and environmental health workforce or health care workforce.
X	Other: Benefits stakeholders with additional information where to locate documents incorporated into the rule to help aide compliance with the requirements. _____	X	Other: Improves the ability for certain specific licensees to monitor occupational exposure of their workers.

1 **DRAFT 1 02/25/2021**

2 **DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT**

3 **Hazardous Materials and Waste Management Division**

4 **RADIATION CONTROL - RADIATION SAFETY REQUIREMENTS FOR WELL LOGGING AND**  
5 **SUBSURFACE TRACER STUDIES**

6 **6 CCR 1007-1 Part 16**

7 *[Editor's Notes follow the text of the rules at the end of this CCR Document.]*

8

9 **Adopted by the Board of Health July 20, 2016 May 19, 2021, effective date July 15, 2021**

10 **PART 16: RADIATION SAFETY REQUIREMENTS FOR WELL LOGGING AND SUBSURFACE**  
11 **TRACER STUDIES**

12

13 [ \* \* \* DENOTES UNAFFECTED SECTIONS/PROVISIONS IN THE DRAFT RULE ]

14 \* \* \*

15 **(16.1.5) Published Material Incorporated by Reference.**

16 ~~Published material incorporated in Part 16 by reference is available in accord with Part 1, Section~~  
17 ~~1.4.~~

18 **A. Throughout this Part 16, federal regulations, state regulations, and standards or**  
19 **guidelines of outside organizations have been adopted and incorporated by**  
20 **reference. Unless a prior version of the incorporated material is otherwise**  
21 **specifically indicated, the materials incorporated by reference cited herein include**  
22 **only those versions that were in effect as of the most recent effective date of this**  
23 **Part 16 (July 2021), and not later amendments or editions of the incorporated**  
24 **material.**

25 **B. Materials incorporated by reference are available for public inspection, and copies**  
26 **(including certified copies) can be obtained at reasonable cost, during normal**  
27 **business hours from the Colorado Department of Public Health and Environment,**  
28 **Hazardous Materials and Waste Management Division, 4300 Cherry Creek Drive**  
29 **South, Denver, Colorado 80246. Additionally,**  
30 **<https://www.colorado.gov/cdphe/radregs> identifies where the incorporated**  
31 **materials are available to the public on the internet at no cost. Due to copyright**  
32 **restrictions certain materials incorporated in this Part are available for public**  
33 **inspection at the state publications depository and distribution center.**

34 **C. Availability from Source Agencies or Organizations.**

35 **1. All federal agency regulations incorporated by reference herein are**  
36 **available at no cost in the online edition of the Code of Federal Regulations**  
37 **(CFR) hosted by the U.S. Government Printing Office, online at**  
38 **[www.govinfo.gov](http://www.govinfo.gov).**

**Commented [JSJ1]:**

**Editorial note1:** All comments (such as this one) shown in the right side margin of this draft document are for information purposes only to assist the reader in understanding the proposed rule change during the review and comment process.

These side margin notes are not part of the rule and all comments will be deleted prior to publication of the final rule by the Colorado Secretary of State.

**Editorial note2:** Alignment and formatting corrections and minor typographical adjustments may be made in the rule and may not be specifically identified with a side margin comment.

**Editorial note3:** Note that this is only a partial rule and only those sections impacted by the proposed changes are included.

**Commented [JSJ2]:**

Adoption and effective dates are tentative and subject to change, pending Board of Health meeting schedule, final adoption of the rule, and the Colorado Register publication dates.

The annual rulemaking schedule (regulatory agenda) for the Department may be found [online](#).

**Commented [JSJ3]:**

Language in section 16.1.5, is revised and amended for consistency with the Colorado Administrative Procedure Act (24-4-103(12.5)(a)(2), CRS) regarding documents incorporated by reference, and consistent with other recently amended rules.

- 39 2. All state regulations incorporated by reference herein are available at no  
40 cost in the online edition of the Code of Colorado Regulations (CCR)  
41 hosted by the Colorado Secretary of State's Office, online at  
42 <https://www.sos.state.co.us/CCR/RegisterHome.do>.
- 43 3. Copies of the standards or guidelines of outside organizations are  
44 available either at no cost or for purchase from the source organizations  
45 listed below.
- 46 a. American National Standards Institute (ANSI)  
47 (Formerly the United States of America Standards Institute)  
48 1899 L Street, NW  
49 11<sup>th</sup> Floor  
50 Washington, DC 20036  
51 <https://www.ansi.org/>  
52

53  
54 \* \* \*

56 16.15.1.1 Has completed training in the subjects outlined in Appendix 16A and  
57 demonstrated an understanding thereof;

**Commented [JSJ4]:** Formatted to remove unneeded spaces/gaps in rule between 16.15.1.1 and 16.15.1.2

- 60 16.15.1.2 Has received copies of and instruction in:
- 61 (1) The regulations contained in the applicable sections of Parts 1, 4, 10 and 16 of  
62 these regulations or their equivalent;
- 63 (2) The license or certificate of registration under which the logging supervisor will  
64 perform well logging; and
- 65 (3) The licensee's or registrant's operating and emergency procedures required by  
66 16.16;

67 \* \* \*

**Commented [JSJ5]:**  
The provisions of 16.17 are revised for consistency with 2020 amendments to U.S. Nuclear Regulatory Commission (NRC) requirements in [10 CFR Part 39.65](#).

68 **16.17 Personnel monitoring.**

69 16.17.1 ~~No licensee or registrant shall permit any individual to act as a logging supervisor or to assist in~~  
70 ~~the handling of sources of radiation unless each such individual wears, at all times during the~~  
71 ~~handling of such sources, a personnel dosimeter that is processed and evaluated by an~~  
72 ~~accredited National Voluntary Laboratory Accreditation Program (NVLAP) processor. The~~  
73 ~~licensee or registrant may not permit an individual to act as a logging supervisor or~~  
74 ~~logging assistant unless that person wears a personnel dosimeter at all times during the~~  
75 ~~handling of licensed radioactive materials or sources of radiation.~~

The NRC amended this federal rule to authorize/allow the use of modern individual monitoring devices in well logging/wireline operations. In the past, NRC has required the use of personnel dosimetry that is processed and evaluated by an accredited National Voluntary Laboratory Accreditation Program (NVLAP) processor. Some new dosimetry devices do not require the type of processing envisioned in the text of the current rule and may instead be read directly by internet-enabled computers, smartphones, and tablets by the licensee/registrant. The design of these newer devices (rather than the qualifications of the processor) allow for collection of accurate dose information. The proposed rule is rephrased to allow the use of individual monitoring devices that do not require NVLAP processing.

76 16.17.1.1 Each personnel dosimeter ~~shall~~ must be assigned to and worn by only one  
77 individual.

78 16.17.1.2 Film badges must be replaced at least monthly **and all other personnel**  
79 **dosimeters that require replacement.** ~~Other types of personnel dosimeter~~ must  
80 be replaced at least quarterly.

Additionally, since Colorado regulates both radioactive materials and machine generated sources of radiation when used in well logging, references to registrants and sources of radiation are retained in the updated language.

NRC [RATS 2020-1](#)  
NRC Compatibility "C"

81 16.17.1.3 ~~After replacement, each personnel dosimeter must be promptly processed.~~ **All**  
82 **personnel dosimeters must be evaluated at least quarterly or promptly after**  
83 **replacement, whichever is more frequent.**

84 16.17.2 The licensee shall provide bioassay services to individuals using licensed materials in subsurface  
85 tracer studies if required by the license.

86 16.17.3 Personnel monitoring records shall be maintained for inspection until the Department authorizes  
87 disposition.  
88

89 \* \* \*

90 [NO FURTHER CHANGES TO THE RULE AFTER THIS POINT]

1 ~~(DRAFT)~~ 1 02/25/2021

2 DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT

3 Hazardous Materials and Waste Management Division

4 RADIATION CONTROL - LICENSES AND RADIATION SAFETY REQUIREMENTS FOR  
5 IRRADIATORS

6 6 CCR 1007-1 Part 19

7 [Editor's Notes follow the text of the rules at the end of this CCR Document.]

8  
9 ~~Adopted~~ by the Board of Health ~~on July 20, 2016~~ May 19, 2021, effective date July 15, 2021

10 PART 19: LICENSES AND RADIATION SAFETY REQUIREMENTS FOR IRRADIATORS

11  
12 [ \* \* \* DENOTES UNAFFECTED SECTIONS/PROVISIONS IN THE DRAFT RULE ]

13 \* \* \*  
14 (19.1.5) Published Material Incorporated by Reference.

15 ~~Published material incorporated in Part 19 by reference is available in accord with Part 1, Section~~  
16 ~~1.4.~~

17 19.1.5.1. Throughout this Part 19, federal regulations, state regulations, and  
18 standards or guidelines of outside organizations have been adopted and  
19 incorporated by reference. Unless a prior version of the incorporated  
20 material is otherwise specifically indicated, the materials incorporated by  
21 reference cited herein include only those versions that were in effect as of  
22 the most recent effective date of this Part 19 (July 2021), and not later  
23 amendments or editions of the incorporated material.

24 19.1.5.2. Materials incorporated by reference are available for public inspection, and  
25 copies (including certified copies) can be obtained at reasonable cost,  
26 during normal business hours from the Colorado Department of Public  
27 Health and Environment, Hazardous Materials and Waste Management  
28 Division, 4300 Cherry Creek Drive South, Denver, Colorado 80246.  
29 Additionally, <https://www.colorado.gov/cdphe/radregs> identifies where the  
30 incorporated materials are available to the public on the internet at no cost.  
31 Due to copyright restrictions certain materials incorporated in this Part are  
32 available for public inspection at the state publications depository and  
33 distribution center.

34 19.1.5.3. Availability from Source Agencies or Organizations.  
35 (1) All federal agency regulations incorporated by reference herein are  
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37 (CFR) hosted by the U.S. Government Printing Office, online at  
38 [www.govinfo.gov](http://www.govinfo.gov).

**Commented [JSJ6]:**  
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Adoption and effective dates are tentative and subject to change, pending Board of Health meeting schedule, final adoption of the rule, and the Colorado Register publication dates.  
The annual rulemaking schedule (regulatory agenda) for the Department may be found [online](#).

**Commented [JSJ8]:**  
Language in section 19.1.5, is revised and amended for consistency with the Colorado Administrative Procedure Act (24-4-103(12.5)(a)(2), CRS) regarding documents incorporated by reference, and consistent with other recently amended rules.

39 (2) All state regulations incorporated by reference herein are available at no  
 40 cost in the online edition of the Code of Colorado Regulations (CCR)  
 41 hosted by the Colorado Secretary of State's Office, online at  
 42 <https://www.sos.state.co.us/CCR/RegisterHome.do>.

43  
 44 \* \* \*

45 "Underwater irradiator" means an irradiator in which the sources always remain shielded under  
 46 water and humans do not have access to the sealed sources or the space subject to irradiation  
 47 without entering the pool.

**Commented [JSJ9]:** Formatted to remove unneeded spaces/gaps in the current rule between the definition "underwater irradiator" and section 19.3.

There are no proposed changes to the regulatory requirements.

50 **SPECIFIC LICENSING REQUIREMENTS**

51 **19.3 Application for a specific license.**

52 \* \* \*

53 **DESIGN AND PERFORMANCE REQUIREMENTS FOR IRRADIATORS**

54 **19.7 Requirements and performance criteria for sealed sources.**

55 Sealed sources shall:

56 19.7.1 Have a certificate of registration issued by the NRC or an Agreement State, or shall have been  
 57 evaluated in accordance with 10 CFR **Part 32.210** or the equivalent state regulation;

58  
 59 \* \* \*

60  
 61 19.8.7 Each entrance to the radiation room of a panoramic irradiator and each entrance to the area  
 62 within the personnel access barrier of an underwater irradiator must be posted as required by  
 63 **Part 4, Section 4.28**.

64 19.8.7.1 Radiation postings for panoramic irradiators must comply with the posting  
 65 requirements of **Part 4, Section 4.28**, except that signs may be removed,  
 66 covered, or otherwise made inoperative when the sources are fully shielded.

**Commented [JSJ10]:** Formatted to delete unneeded spaces/gaps in the current rule between 19.8.7.1 and 19.8.8.

There are no proposed changes to the regulatory requirements.

68 19.8.8 If the radiation room of a panoramic irradiator has roof plugs or other movable shielding, it must  
 69 not be possible to operate the irradiator unless the shielding is in its proper location.

70  
 71 \* \* \*

72 19.12.4 Each control for a panoramic irradiator must be clearly marked as to its function.

**Commented [JSJ11]:** Formatted to delete unneeded spaces/gaps in the current rule between 19.12.4 and 19.13.

There are no proposed changes to the regulatory requirements.



76 **19.13 Irradiator pools.**

77 \* \* \*

78 19.17.1.6 Source Rack

79 (1) For panoramic irradiators, the licensee shall test the movement of the source  
80 racks for proper operation prior to source loading, and testing must include  
81 source rack lowering due to simulated loss of power.

82 (2) For all irradiators with product conveyor systems, the licensee shall observe and  
83 test the operation of the conveyor system to assure that the requirements in  
84 19.14 are met for protection of the source rack and the mechanism that moves  
85 the rack.

86 (3) Testing must include tests of any limit switches and interlocks used to protect the  
87 source rack and mechanism that moves the rack from moving product carriers.

89 19.17.1.7 Access Control.

90 (1) For panoramic irradiators, the licensee shall test the completed access control  
91 system to assure that it functions as designed and that all alarms, controls, and  
92 interlocks work properly.

93  
94 \* \* \*

95 19.18.7 Individuals who must be prepared to respond to alarms required by 19.8.2, 19.8.9, 19.10.1,  
96 19.11.1, 19.11.2, and 19.22.2 shall be trained and tested on how to respond.

97 19.18.7.1 Each individual shall be retested at least once a year.

98 19.18.7.2 Tests may be oral.

100 **19.19 Operating and emergency procedures.**

101  
102 \* \* \*

104 **19.20 Personnel monitoring.**

105 ~~(19.20.1) Irradiator operators shall wear a personnel dosimeter that is processed and evaluated by an~~  
106 ~~accredited National Voluntary Laboratory Accreditation Program (NVLAP) processor while~~  
107 ~~operating a panoramic irradiator or while in the area around the pool of an underwater~~  
108 ~~irradiator. Irradiator operators shall wear a personnel dosimeter while operating a~~  
109 ~~panoramic irradiator or while in the area around the pool of an underwater irradiator.~~

110 19.20.1.1 The personnel dosimeter processor must be accredited for high energy photons  
111 in the normal and accident dose ranges (see Part 4, Section 4.17.3). The personnel  
112 dosimeter must be capable of detecting high energy photons in the normal and  
113 accident dose ranges.

**Commented [JSJ12]:**  
Formatted to delete unneeded spaces/gaps in the current rule between 19.17.1.6(3) and 19.17.1.7.  
  
There are no proposed changes to the regulatory requirements.

**Commented [JSJ13]:**  
Formatted to delete unneeded spaces/gaps between 19.18.7.2 and 19.19 in the current rule.  
  
There are no proposed changes to the regulatory requirements.

**Commented [JSJ14]:**  
The provisions of 19.20 are revised for consistency with 2020 amendments to U.S. Nuclear Regulatory Commission (NRC) regulations in [10 CFR Part 36.55](#).  
  
The NRC amended this federal rule to authorize/allow the use of modern individual monitoring devices at panoramic irradiator facilities. In the past, NRC has required the use of personnel dosimetry that is processed and evaluated by an accredited National Voluntary Laboratory Accreditation Program (NVLAP) processor. Some new dosimetry devices do not require the type of processing envisioned in the text of the prior rule and may instead be read directly by internet-enabled computers, smartphones, and tablets by the licensee. The design of these newer devices (rather than the qualifications of the processor) allow for collection of accurate dose information. The proposed rule is rephrased to allow the use of individual monitoring devices that do not require NVLAP processing.  
  
NRC [RATS 2020-1](#)  
NRC Compatibility "H&S"

114 19.20.1.2 Each personnel dosimeter must be assigned to and worn by only one individual.

115 19.20.1.3 Film badges must be ~~processed~~ replaced at least monthly and all other  
116 personnel dosimeters that require replacement must be ~~processed~~ replaced at  
117 least quarterly.

118 19.20.1.4 ~~After replacement, each personnel dosimeter must be promptly processed. All~~  
119 ~~personnel dosimeters must be evaluated at least quarterly or promptly after~~  
120 ~~replacement, whichever is more frequent.~~

121 \* \* \*

122 19.21.2 If the radiation levels specified in 19.9 are exceeded, the facility must be modified to comply with  
123 the requirements in 19.9.

124 } **Commented [JSJ15]:**  
125 Formatted to delete unneeded spaces/gaps in the current rule between 19.21.2 and 19.21.3.  
  
126 19.21.3 Portable radiation survey meters must be calibrated at least annually to an accuracy of 20  
127 percent for the gamma energy of the sources in use.  
128 There are no proposed changes to the regulatory requirements.

128 \* \* \*

129 19.25.2 At a panoramic irradiator at which static irradiations (no movement of the product) are occurring,  
130 an individual who has received the training required in 19.18.7 on how to respond to alarms must  
131 be onsite.

132 } **Commented [JSJ16]:**  
133 Formatted to delete unneeded spaces/gaps in the current rule between 19.25.2 and 19.25.3.  
134 There are no proposed changes to the regulatory requirements.

135 19.25.3 At an underwater irradiator, an irradiator operator must be present at the facility whenever the  
136 product is moved into or out of the pool.

137 \* \* \*

138 19.27.2.1 Authorization will not be granted unless the licensee can demonstrate that a fire  
139 in the radiation room could be controlled without damage to the sealed sources or safety  
140 systems and without radiation overexposures of personnel.

141 } **Commented [JSJ17]:**  
142 Formatted to delete unneeded spaces/gaps in the current rule between 19.27.2.1 and 19.28.  
143 There are no proposed changes to the regulatory requirements.  
144

145 **RECORDS AND REPORTS**

146 **19.28 Records and retention periods.**

147 19.28.1 The licensee shall maintain the following records at the irradiator for the periods specified:

148 19.28.1.1 A copy of the license, license conditions, documents incorporated into a license  
149 by reference, and amendments thereto until superseded by new documents or until the  
150 Department terminates the license for documents not superseded;

151 19.28.1.2 Records of each individual's training, tests, and safety reviews provided to meet  
152 the requirements of 19.18.1, 19.18.2, 19.18.3, 19.18.4, 19.18.6, and 19.18.7 until 3 years  
153 after the individual terminates work;

154 19.28.1.3 Records of the annual evaluations of the safety performance of irradiator  
155 operators required by 19.18.5 for 3 years after the evaluation;

156 19.28.1.4 A copy of the current operating and emergency procedures required by 19.19  
157 until superseded or the Department terminates the license. Records of the radiation  
158 safety officer's review and approval of changes in procedures as required by 19.19.3.3  
159 retained for 3 years from the date of the change;

160 ~~19.28.1.5~~ Evaluations of personnel dosimeters (~~film badge, optically stimulated~~  
161 ~~luminescence and thermoluminescence dosimeter~~) required by 19.20 in accordance with  
162 Part 4, Section 4.46 until the Department terminates the license;

\* \* \*

164 19.28.1.13 Records related to decommissioning of the irradiator as required by Part 3,  
165 Section 3.16.5.

166  
167

168 **19.29 Reports.**

\* \* \*

169

170 [NO FURTHER CHANGES TO THE RULE AFTER THIS POINT]

171

172

**Commented [JSJ18]:**  
Reference to specific types of dosimeters is removed for consistency with the proposed change in Section 19.20. The proposed change will also make the language consistent with [10 CFR Part 36.81\(e\)](#).

**Commented [JSJ19]:**  
Formatted to delete unneeded spaces/gaps in the current rule between 19.28.1.13 and 19.29.  
There are no proposed changes to the regulatory requirements.