ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 61

[EPA–HQ–OAR–2008–0218; FRL–9957–54–OAR]

RIN 2060–AP26

Revisions to National Emission Standards for Radon Emissions From Operating Mill Tailings

AGENCY: Environmental Protection Agency (EPA).

ACTION: Final rule.

SUMMARY: The Environmental Protection Agency (EPA) is taking final action to revise certain portions of the National Emission Standards for Hazardous Air Pollutants (NESHAP) for Radon Emissions from Operating Mill Tailings. The revisions for this final action are based on the EPA's determination as to what constitutes generally available control technology or management practices (GACT) for this area source category. We are also adding new definitions to the NESHAP, revising existing definitions and clarifying that the NESHAP also applies to uranium recovery facilities that extract uranium through the in-situ leach method and the heap leach method.

DATES: This rule is effective on March 20, 2017.

ADDRESSES: The EPA has established a docket for this action under Docket ID No. EPA–HQ–OAR–2008–0218. All documents in the docket are listed on the *http://www.regulations.gov* Web site. Although listed in the index, some information is not publicly available, *e.g.,* Confidential Business Information (CBI) or other information whose disclosure is restricted by statute. Certain other material, such as copyrighted material, is not placed on the Internet and will be publicly available only in hard copy form. Publicly available docket materials are available electronically through *http://www.regulations.gov.*

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SUPPLEMENTARY INFORMATION:

Throughout this document, ''we,'' ''us'' and ''our'' refer to the EPA.

Preamble Acronyms and Abbreviations. We use the following acronyms and abbreviations in this document:

AEA—Atomic Energy Act
ALARA—As low as reasonably achievable
BID—Background information document
CAA—Clean Air Act
CAAA—Clean Air Act Amendments of 1990
CCAT—Colorado Citizens Against Toxic Waste
CFR—Code of Federal Regulations
Ci—Curie, a unit of radioactivity equal to the amount of a radioactive isotope that decays at the rate of 3.7×10^{10} disintegrations per second
DOE—U.S. Department of Energy
EIA—Economic impact analysis
EO—Executive Order
EPA—U.S. Environmental Protection Agency
FR—Federal Register
GACT—Generally Available Control Technology
HAP—Hazardous Air Pollutant
ISL—In-situ leach uranium recovery, also known as in-situ recovery (ISR)
mrem—millirem, 1×10^{-3} rem—a unit of radiation exposure
MACT—Maximum Achievable Control Technology
MOU—Memorandum of Understanding
NESHAP—National Emission Standard for Hazardous Air Pollutants
NRC—U.S. Nuclear Regulatory Commission
NTAA—National Tribal Air Association
OMB—Office of Management and Budget
pCi—picocurie, 1×10^{-12} curie
Ra-226—Radium-226
Rn-222—Radon-222
Radon flux—A term applied to the amount of radon crossing a unit area per unit time, as in picocuries per square centimeter per second (pCi/m^2/sec)
RCRA—Resource Conservation and Recovery Act
Subpart W—National Emission Standards for Radon Emissions from Operating Mill Tailings at 40 CFR 61.250–61.256
SWIPR—Subpart W Impoundment Photographic Reporting
tpy—tons per year
U_3O_8—uranium oxide, also known as ''yellowcake''
UMTRCA—Uranium Mill Tailings Radiation Control Act of 1978
U.S.C.—United States Code

Background Information. In this action we are finalizing changes to the NESHAP for Radon Emissions from Operating Mill Tailings. These changes were proposed on May 2, 2014 (79 FR 25388) as part of a review of pre-1990 NESHAPs pursuant to Clean Air Act Section 112(q)(1). After review of the public comments we have made some changes to the rule since the proposal, and these will be discussed later in this document. We summarize some of the more significant comments received regarding the proposed rule and provide our responses in this preamble. A summary of all other public comments on the proposal and the EPA's responses to those comments is provided in the ''Summary and Response to Public Comments'' document, which is available in Docket ID No. EPA–HQ–OAR–2008–0218. The ''track changes'' version of the regulatory language that incorporates the changes in this final action resulting from review by the Office of Management and Budget (OMB) is also available in the docket for this rulemaking.

Outline. The information in this preamble is organized as follows:

I. General Information

A. Executive Summary

1. Introduction

This final rule amends requirements promulgated in 1989 under the Clean Air Act to control emissions of radon-222 from operating structures used to manage uranium byproduct material or tailings [1] at uranium recovery facilities. The rule does not apply to disposal of uranium byproduct material or tailings. The rule retains monitoring requirements for certain uranium byproduct material or tailings impoundments in existence on or before December 15, 1989 and establishes generally available control technology or management practices (GACT) for other impoundments and heap leach piles. This final rule completes the EPA's obligation under the requirements of CAA section 112(q)(1) to ''review, and if appropriate, revise'' 40 CFR part 61, subpart W (hereafter Subpart W).

Uranium recovery and processing currently occurs by one of three methods: (1) Conventional milling; (2) in-situ leach (ISL); and (3) heap leach. A conventional uranium mill is a chemical plant that extracts uranium from ore that has typically been obtained from an underground or open-pit mine. The ore is crushed and the uranium leached using chemical solutions, concentrated into uranium oxide (U_3O_8 or ''yellowcake''), and transported to a uranium conversion facility to begin the processing into fuel for nuclear reactors. Solid and liquid wastes produced during this process are called uranium byproduct material or tailings. Uranium byproduct material or tailings contains residual uranium, radium and heavy metals. Radon-222 is generated by the decay of radium-226. As defined in this final rule, conventional impoundments are used to manage the mostly solid wastes from processing. Non-conventional impoundments, also known as evaporation or holding ponds, are used to manage process liquids and effluents. Non-conventional impoundments may accumulate sediments at the bottom as solids contained in the liquids settle out. Conventional impoundments are permanent structures that require long-term stewardship. Non-conventional impoundments are typically removed at facility closure and often placed into conventional impoundments for disposal. Non-conventional impoundments are sometimes also designed to be used as conventional impoundments as needed.

ISL is often used when a uranium ore body is in a formation through which ground water flows. A liquid solution containing chemicals can be injected into the formation to mobilize the uranium into solution, which is then recovered and processed. Process liquids and effluents from ISL are managed in non-conventional impoundments. ISL is now the predominant form of uranium recovery in the United States.

Heap leaching is a method of processing that is expected to be used for low-grade ore or in other situations where it is economically favorable. During heap leaching a pile of ore is sprayed with a chemical solution and uranium leaches into solution. The uranium solution is collected at the bottom of the pile and further processed. At the end of processing, the heap leach pile may be closed in place (typically by being covered), or removed and placed in a conventional impoundment. Process liquids and effluents are managed in non-conventional impoundments. At the time of this rulemaking, there are no heap leach facilities in the United States, although one such facility is planned.

There is currently one operating conventional mill in the United States, the White Mesa Mill in Utah. Two other conventional mills remain on standby, the Shootaring Canyon Mill in Utah and the Sweetwater Mill in Wyoming. There are six operating ISL facilities: Crow Butte in Nebraska; Smith Ranch, Lost Creek, Nichols Ranch, Willow Creek (which includes the Irigary and Christensen Ranch wellfields) and Ross CPP, all in Wyoming. Four other ISL facilities have operated and are now in standby. They are Alta Mesa, Kingsville Dome,[2] Rosita and Hobson/La Palangana, all located in Texas. These facilities are subject to the requirements of Subpart W. There are no heap leach facilities operating or on standby. Future heap leach facilities, as well as conventional mills and ISL facilities that have been or are being licensed, will be subject to Subpart W when they begin operating.

Subpart W was initially promulgated in 1986 and amended pursuant to a voluntary remand in 1989. For CAA section 112 standards that were in effect before November 15, 1990, CAA section 112(q)(1) requires the EPA to review, and, if appropriate, revise such standards to comply with the requirements of subsection (d). As a result of this review, we are promulgating this final rule pursuant to

[1] The EPA first defined the term ''uranium byproduct material or tailings'' in 1986 (51 FR 34066). The 1986 and 1989 rulemakings were primarily concerned with, but not limited to, conventional mill tailings as the most significant source of radon. We used the term ''tailings'' throughout those rulemakings for simplicity, reflecting that rulemaking emphasis. We understand that this has contributed to the impression among some stakeholders that Subpart W cannot apply to materials other than the mostly solid wastes resulting from conventional milling that are managed, and ultimately disposed, in permanent impoundments. We are reiterating in this action that the term ''uranium byproduct material or tailings'' more broadly defines the materials that are subject to Subpart W.

[2] Operating permits at the Kingsville Dome facility have lapsed and may not be renewed; however, because there are still uranium resources that could be exploited, Kingsville Dome is considered to be on standby for purposes of this discussion.

CAA sections 112(q) and 112(d) and setting standards that comply with the requirements of CAA section 112(d)(5). CAA section 112(d)(5) addresses standards for area sources and provides that section 112(d) standards for area sources may provide for the use of GACT by the affected area sources.

Subpart W regulates facilities and materials that are also regulated under the authority of the Uranium Mill Tailings Radiation Control Act of 1978 (UMTRCA). UMTRCA directed the EPA to establish standards of general application to protect public health, safety and the environment from hazards associated with wastes from extraction or concentration of uranium or thorium. The Nuclear Regulatory Commission (NRC) implements and enforces the EPA's standards through its licensing and regulatory program. By establishing requirements to control radon emissions from uranium byproduct material or tailings during the facility's operational period, Subpart W supports and works in harmony with the NRC's UMTRCA-based provisions that limit radon concentrations at the site boundary.

2. Provisions of the 1989 Rule

When promulgated in 1989, Subpart W established monitoring requirements and work practices as methods to control radon emissions from impoundments used to manage uranium byproduct material or tailings (51 FR 51654, December 15, 1989). Existing impoundments (those operating as of December 15, 1989) were required to comply with a radon flux standard of 20 pCi/m^2-sec, monitored using Method 115. New impoundments built after December 15, 1989 were required to be operated in accordance with the provisions of 40 CFR 192.32(a) and be designed to meet one of two work practices:

• Phased disposal in impoundments no larger than 40 acres in area, with no more than two such impoundments operating at any one time; or

• Continuous disposal of tailings such that tailings are dewatered and immediately disposed with no more than 10 acres of tailings exposed at any one time.

All impoundments were required to be operated to comply with the requirements of 40 CFR 192.32(a),[3] notwithstanding the exemption in § 192.32(a)(1) for impoundments constructed prior to the promulgation of 40 CFR part 192. This provision was incorporated to ensure that older impoundments were equipped with liners capable of retaining liquids within the impoundment and monitoring systems capable of detecting leakages. Leaks could allow the contents of the impoundment to dry out and increase radon emissions. As originally promulgated in 1986, Subpart W envisioned that older impoundments would not be in use beyond December 31, 1992 unless granted an exemption or extension. Such impoundments were not required to comply with the provisions of 40 CFR 192.32(a). The 1989 rulemaking eliminated the prohibition on using existing impoundments beyond December 31, 1992 and required older impoundments to comply with the requirements at 40 CFR 192.32(a) (51 FR 34066, September 24, 1986 and 54 FR 51680, December 15, 1989).

3. Provisions of the Final Rule

This final rule defines and establishes GACT-based standards for conventional and non-conventional impoundments and heap leach piles; in doing so, the final rule clarifies the applicability of the 1989 rule to these different types of units and distinguishes among them. The final rule retains the radon flux standard and monitoring requirements for conventional impoundments in existence on December 15, 1989, and retains the provision that extended the construction requirements in 40 CFR 192.32(a)(1) to these conventional impoundments. The final rule also formalizes the 1989 management practices as GACT-based standards for conventional impoundments constructed after December 15, 1989, with limited changes to the 1989 standard—the final rule focuses the cross-reference regarding the impoundment construction requirements to 40 CFR 192.32(a)(1), instead of a more broad reference to 40 CFR 192.32(a) and removes the phrase ''as determined by the Nuclear Regulatory Commission.'' In addition, the final rule establishes GACT-based standards for non-conventional impoundments and heap leach piles, as follows:

• Non-conventional impoundments must maintain solid materials in a saturated condition, with no solid materials visible above the level of liquid in the impoundment;

• Heap leach piles that have completed their operational life but not yet entered closure are limited to no more than two such piles with an area no greater than 40 acres each; and

• Conformance to the construction requirements in 40 CFR 192.32(a)(1).

The final rule changes some existing definitions and adds several new definitions. The amended definition of ''operation'' is finalized as proposed. The definitions of ''continuous disposal,'' ''dewatered,'' ''existing impoundment,'' and ''phased disposal'' are amended to conform to the amended definition of ''operation.'' New definitions of ''standby,'' ''conventional impoundment,'' ''non-conventional impoundment,'' ''heap leach pile,'' ''heap leach pile operational life,'' and ''uranium recovery facility'' are also being finalized as proposed. New definitions of ''final closure'' and ''reclamation plan'' are added to the final rule to clarify when Subpart W no longer applies to an impoundment or heap leach pile.

4. Key Changes to the Proposal

The proposed rule contained several provisions that are modified in the final rule in response to public comments. We proposed to eliminate the radon flux standard and monitoring requirement for impoundments in existence on December 15, 1989. We believed this was appropriate based on information that indicated that the remaining impoundments in this category could comply with the GACT-based management practices. Information received through public comments demonstrated that the assumptions that supported our proposal were not correct and also that the pre-1989 unit that was expected to close (Cell 3 at the White Mesa Mill) remains open. Therefore, the final rule retains the radon flux standard and monitoring requirement for conventional impoundments in existence on December 15, 1989.

We proposed that non-conventional impoundments maintain one meter of liquid above any solid materials in the impoundment. Our analyses indicate that liquids effectively attenuate radon emissions, and that one meter of liquid would reduce the radon emissions by greater than 99%, to a level nearly indistinguishable from background. Based on public comment regarding feasibility and cost associated with the

[3] 40 CFR 192.32(a) includes six elements, which apply during processing and prior to the end of the closure period: (1) Construction of impoundments in conformance with the requirements of 40 CFR 264.221; (2) conformance to the groundwater protection standards in 40 CFR 264.92 and related sections; (3) placement of a permanent radon barrier on nonoperational impoundments; (4) demonstration that the permanent radon barrier limits radon releases to no greater than 20 pCi/m^2-sec; (5) conformance to the requirements of 40 CFR part 190 and 40 CFR part 440; and (6) maintenance by NRC of public doses from radon emissions as far below the Federal Radiation Protection Guidance as practicable. Only § 192.32(a)(1) is directly relevant to the goals of Subpart W, which in turn facilitate NRC in achieving § 192.32(a)(6).

water demand to maintain the liquid level in the impoundment, the final rule requires only that solid materials remain saturated. Saturation will effectively reduce radon emissions by approximately 95% compared to dry uranium byproduct material or tailing. The water demand to maintain saturation should also be considerably reduced compared to the proposal.

We proposed that heap leach piles be regulated under Subpart W from the time they begin processing (*i.e.,* at the time the leaching solution is first applied), because uranium byproduct material or tailings begins to be generated at that time. We proposed they be limited in size (40 acres) and number (no more than two operating at any one time), and maintain a 30% moisture content to reduce radon emissions. Based on public comment, the final rule provides that heap leach piles become subject to Subpart W once they have finished their operational life, when their sole purpose is to manage uranium byproduct material or tailings. As commenters pointed out, this is consistent with the approach we have taken for conventional mills, where waste material that has been separated from the recovered uranium has not been regulated under Subpart W until it leaves the processing unit and is deposited in an impoundment. Further, Subpart W will only apply to post-processing heap leach piles until they enter the closure process. The final rule retains the proposed area and number limitations on piles that are between processing and closure.

5. Economic Impacts

This final rule will have limited economic impact. No new requirements are placed on conventional impoundments. Further, impacts associated with non-conventional impoundments and heap leach piles will be less than those estimated for the proposed rule. Operators of non-conventional impoundments and heap leach piles will not incur additional cost related to liners, which are required by other regulations. Operators of non-conventional impoundments will be required to maintain liquids in the impoundment such that no solids are visible above the liquid level. In addition, operators of heap leach facilities can reduce the period of time they are subject to Subpart W and thus reduce compliance costs by expeditiously beginning the closure process after the operational life of the pile has ended, and we encourage timely closure in all cases.

Table 1 presents a summary of the unit cost (per pound of U_3O_8) for implementing each GACT-based standard at each of the three types of uranium recovery facilities. In addition to presenting the GACT costs individually, Table 1 presents the total unit cost to implement all relevant GACT-based standards at each type of facility. Table 1 shows that a conventional mill will have both conventional and non-conventional impoundments, and be required to maintain saturation in the non-conventional impoundments.

TABLE 1—FINAL GACT-BASED STANDARDS COSTS PER POUND OF U_3O_8

	Unit cost ($/lb U_3O_8)		
	Conventional mills	ISL facilities	Heap leach
GACT—Double Liners for Conventional Impoundments *	$1.04		
GACT—Double Liners for Non-conventional Impoundments *	1.04	3.07	0.22
GACT—Maintaining Non-conventional Impoundment Sediments 100% Saturated	0.015	0.026	0.0013
GACT—Liners for Heap Leach Piles *			2.01
GACTs—Total for All Four	2.09	3.09	2.24
Baseline Facility Costs ** (EIA Section 6.2)	55.18	51.31	45.06

* Liners required by 40 CFR part 192.
** Based on a price of U_3O_8 of $55/lb.

Based on the information in Table 1, the four GACT-based standards represent about 4%, 6%, and 5% of the baseline cost (per pound of U_3O_8) at conventional, ISL, and heap leach uranium recovery facilities, respectively. The table shows that, at a market price of $55 per pound, the baseline facility costs for a conventional mill are greater than the market price of uranium. However, since the liner requirements would have to be met under 40 CFR part 192, these costs are not actually being imposed by Subpart W. The only cost associated with the final rule is the cost of maintaining saturation in the non-conventional impoundments, which is minimal.

6. Public Engagement

During development of the proposed rule and throughout the public comment period, the EPA engaged with stakeholders and sought public input. Subsequent to beginning the rulemaking process, the EPA entered into a settlement agreement in August 2009 with Colorado Citizens Against Toxic Waste (CCAT) and Rocky Mountain Clean Air Action. As part of the settlement agreement, the EPA agreed to:

• Provide three public presentations and a national webinar on the rulemaking;

• Conduct quarterly stakeholder conference calls on the status of the rulemaking; and

• Create a public Web site and post non-privileged records.

The EPA conducted public presentations in June 2009 in Cañon City, Colorado, near the Cotter Mill; in October 2009 in Rapid City, South Dakota, in conjunction with the Western Mining Action Network's semi-annual conference; and in May 2010 on lands of the Ute Mountain Ute Tribe in southeastern Utah, near the White Mesa Mill. The EPA also presented a national webinar in June 2010. Records of EPA's quarterly stakeholder calls and non-privileged records regarding this Subpart W rulemaking are available at the following public Web site: *https://www.epa.gov/radiation/subpart-w-rulemaking-activity.*

In addition to the presentations specified in the settlement agreement, the EPA conducted presentations at numerous industry-sponsored events, particularly the annual uranium recovery workshop sponsored by the NRC and the National Mining Association (NMA). Beginning in 2009, the EPA provided regular updates on the Subpart W rulemaking at these annual workshops. The EPA also provided a presentation for NMA officials in October 2009 and participated in NRC's uranium recovery licensing workshop in January 2011.

The EPA also actively sought interactions with tribal stakeholders. Several current or proposed uranium recovery facilities are of interest to tribes. The White Mesa Mill is located just north of Ute Mountain Ute lands in southeastern Utah. The Oglala Sioux Tribe has been active in the renewal of the operating license for the Crow Butte ISL facility in northwestern Nebraska and the initial licensing of the proposed Dewey-Burdock ISL facility in southwestern South Dakota. The Navajo Nation has been active in the development of proposed ISL facilities in New Mexico.

The EPA conducted presentations at the Uranium Contamination Stakeholder Workshops in 2009 and 2010 in Gallup, New Mexico and Tuba City, Arizona, respectively. In addition to the presentations, the EPA also held discussions with representatives from the Navajo EPA and the Hopi Tribe. In June 2014, after the proposed rule was published, the EPA gave a presentation for the National Tribal Air Association (NTAA) on the monthly NTAA/EPA policy call.

Concurrent with issuance of the 2014 proposed rule, the EPA sent letters to 53 tribal leaders offering consultation on the rule, consistent with the EPA's ''Policy on Consultation and Coordination with Indian Tribes.'' Consultation is a process of meaningful communication and coordination between the EPA and tribal officials prior to the EPA taking actions or implementing decisions that may affect tribes. The Ute Mountain Ute Tribe responded and requested a formal consultation. The consultation was held in July 2014 between officials of the EPA's Office of Radiation and Indoor Air in Washington, DC and officials from EPA Region 8 and the Tribe at Tribal headquarters in Towaoc, Colorado (Docket No. EPA–HQ–OAR–2008–0218–0120).

The EPA has also met with individual stakeholder groups. Prior to publication of the proposed rule, the EPA met with representatives from CCAT, Uranium Watch, and the Sheep Mountain Alliance. Following publication of the proposed rule, the EPA met with the Southern Environmental Law Center. Concurrent with public hearings in September 2014, the EPA met with representatives from CCAT and the Energy Minerals Law Center. Following the public comment period, in November 2014 the EPA met with representatives from Uranium Watch and the Information Network for Responsible Mining (INFORM).

B. Does this action apply to me?

The regulated categories and entities potentially affected by the final standards are shown below in Table 2:

TABLE 2—INDUSTRIAL SOURCE CATEGORIES AFFECTED BY THIS FINAL ACTION

Category	NAICS code [1]	Examples of regulated entities
Industry:		
Uranium Ores Mining and/or Beneficiating	212291	Area source facilities that extract or concentrate uranium from any ore processed primarily for its source material content.
Leaching of Uranium, Radium or Vanadium Ores	212291	Area source facilities that extract or concentrate uranium from any ore processed primarily for its source material content.

[1] North American Industry Classification System.

This table is not intended to be exhaustive, but rather provides a guide for readers regarding entities likely to be affected by this final action. If you have any questions regarding the applicability of this action to a particular entity, consult either the air permit authority for the entity or your EPA regional representative as listed in 40 CFR 61.04 of subpart A (General Provisions).

C. Where can I get a copy of this document and other related information?

In addition to being available in the docket, an electronic copy of this final action will also be available on the Internet. Following signature, a copy of this final action will be posted at the following address: *https://www.epa.gov/radiation/subpart-w-national-emission-standards-radon-emissions-operating-mill-tailings.* Following publication in the **Federal Register**, the EPA will post the **Federal Register** version and key technical documents at this same Web site.

D. Judicial Review and Administrative Reconsideration

Under CAA section 307(b)(1), judicial review of this final action is available only by filing a petition for review in the United States Court of Appeals for the District of Columbia Circuit by March 20, 2017. Under CAA section 307(b)(2), the requirements established by this final rule may not be challenged separately in any civil or criminal proceedings brought by the EPA to enforce the requirements.

Section 307(d)(7)(B) of the CAA further provides that ''[o]nly an objection to a rule or procedure which was raised with reasonable specificity during the period for public comment (including any public hearing) may be raised during judicial review.'' This section also provides a mechanism for the EPA to reconsider the rule ''[i]f the person raising an objection can demonstrate to the Administrator that it was impracticable to raise such objection within [the period for public comment] or if the grounds for such objection arose after the period for public comment (but within the time specified for judicial review) and if such objection is of central relevance to the outcome of the rule.'' Any person seeking to make such a demonstration should submit a Petition for Reconsideration to the Office of the Administrator, U.S. EPA, Room 3000, EPA WJC West Building, 1200 Pennsylvania Ave. NW., Washington, DC 20460, with a copy to both the person(s) listed in the preceding **FOR FURTHER INFORMATION CONTACT** section, and the Associate General Counsel for the Air and Radiation Law Office, Office of General Counsel (Mail Code 2344A), U.S. EPA, 1200 Pennsylvania Ave. NW., Washington, DC 20460.

II. Background

A. What is the Agency's legal authority for taking this action?

Section 112(q)(1) of the Clean Air Act (CAA) requires that NESHAPs ''in effect before the date of enactment of the Clean Air Act Amendments of 1990 [Nov. 15, 1990] . . . shall be reviewed and, if appropriate, revised, to comply with the requirements of subsection (d) of . . . section [112].'' The EPA promulgated 40 CFR part 61, subpart W, ''National Emission Standards for Radon Emissions from Operating Mill

Tailings,'' (Subpart W) on December 15, 1989.[4] The EPA conducted this review of Subpart W under CAA section 112(q)(1).

Section 112(d) of the CAA requires the EPA to establish emission standards for major and area sources. A major source is any stationary source that emits or has the potential to emit 10 tons per year (tpy) or more of any single HAP or 25 tpy or more of any combination of HAPs. An area source is a stationary source of HAP that is not a major source. For operating uranium byproduct material or tailings impoundments, the HAP of concern is radon-222 (hereafter referred to as ''radon'' or Rn-222). Radon emissions from operating uranium recovery facilities are far below the statutory thresholds[5] and EPA has not set alternative criteria for identifying major sources of radionuclide emissions; thus, all sources regulated under Subpart W are area sources (EPA–HQ–OAR–2008–0218–0001, 0002). See Section IV.A.2.

Section 112(q)(1) does not dictate how the EPA must conduct its review of those NESHAPs issued prior to 1990. Rather, it provides that the Agency must review, and, if appropriate, revise the standards to comply with the requirements of section 112(d). Determining what revisions, if any, are appropriate for these NESHAPs is best assessed through a case-by-case consideration of each NESHAP. As explained below, in this case, we have reviewed Subpart W and are revising the standards consistent with section 112(d)(5), which addresses standards for area sources. After our review, we determined it was appropriate to revise Subpart W to clarify the applicability of the rule to non-conventional impoundments and heap leach piles and promulgate standards that are more appropriate for controlling radon emissions at those sources, consistent with the requirements of CAA section 112(d)(5). All units regulated by Subpart W are area sources and we determined that promulgating GACT-based standards under CAA section 112(d)(5) is appropriate for these sources.

For area sources, the Administrator has the discretion under CAA section 112(d)(5) to set standards based on GACT in lieu of maximum achievable control technology (MACT) under sections 112(d)(2) and (d)(3), which is required for major sources. Under CAA section 112(d)(5), the Administrator may elect to promulgate standards or requirements for area sources ''which provide for the use of generally available control technologies or management practices by such sources to reduce emissions of hazardous air pollutants.'' Consistent with section 112(d)(5), we are revising Subpart W to reflect GACT-based standards.

B. What source category is affected by the final rule?

The source category regulated under Subpart W, first defined in 1986, is facilities licensed to manage uranium byproduct material during and following the processing of uranium ores, commonly referred to as uranium mills and their associated tailings. Licenses are issued by the U.S. Nuclear Regulatory Commission (NRC) or NRC Agreement States. As promulgated in 1986 and 1989, Subpart W defines ''uranium byproduct material or tailings'' as ''the waste produced by the extraction or concentration of uranium from any ore processed primarily for its source material content.''[6] Neither of these definitions is affected by this action. For clarity, in this action we refer to this source category by the term ''uranium recovery facilities,'' and we are adding this phrase to the definitions section of the rule. Use of this term encompasses the existing universe of facilities whose HAP emissions are currently regulated under Subpart W. Uranium recovery facilities process uranium ore to extract uranium. The HAP emissions from any type of uranium recovery facility that manages uranium byproduct material or tailings are subject to regulation under Subpart W. This currently includes three types of uranium recovery facilities: (1) Conventional uranium mills; (2) ISL facilities; and (3) heap leach facilities. Subpart W requirements specifically apply to the affected sources at the uranium recovery facilities that are used to manage or contain the uranium byproduct material or tailings. Common names for these structures may include, but are not limited to, impoundments, tailings impoundments, tailings piles, evaporation or holding ponds, and heap leach piles. However, the name itself is not important for determining whether Subpart W requirements apply to that structure; rather, applicability is based on what these structures contain and the use of these structures to manage or contain uranium byproduct material or tailings.

C. How does Subpart W regulate HAP emissions from the source category?

Subpart W was initially promulgated on September 24, 1986 (51 FR 34056) and amended pursuant to a voluntary remand on December 15, 1989 (54 FR 51654). At the time of promulgation in the 1980s, the predominant form of uranium recovery was through the use of conventional mills. As promulgated in 1989, Subpart W contained two separate standards. The first standard applied to ''existing'' impoundments, *i.e.,* those in existence and licensed by the NRC (or its Agreement States) on or prior to December 15, 1989. Owners or operators of existing tailings impoundments were required to ensure that emissions from those impoundments did not exceed a radon (Rn-222) flux standard of 20 picocuries per meter squared per second (pCi/m^2-sec). As stated at the time of promulgation: ''This rule will have the practical effect of requiring the mill owners to keep their piles wet or covered'' (54 FR 51689). Keeping the piles (impoundments) wet or covered with soil would reduce radon emissions to a level that would meet the standard. This is still considered an effective method to reduce radon emissions at all uranium byproduct material or tailings impoundments.

The method for monitoring for compliance with the radon flux standard was prescribed as Method 115, found at 40 CFR part 61, Appendix B. The owners or operators of existing impoundments were required to report to the EPA the results of the compliance testing for any calendar year by no later than March 31 of the following year.

There is currently one operating mill with impoundments that pre-date December 15, 1989, and two mills that are currently in standby mode. All of

[4] On April 26, 2007, Colorado Citizens Against Toxic Waste (CCAT) and Rocky Mountain Clean Air Action filed a lawsuit against EPA (EPA–HQ–OAR–2008–0218–0013) for EPA's alleged failure to review and, if appropriate, revise NESHAP Subpart W under CAA section 112(q)(1). A settlement agreement was entered into between the parties in November 2009 (EPA–HQ–OAR–2008–0218–0020, 0021).

[5] Annual emissions of radon from a 40-acre impoundment, assuming a radon flux of 20 pCi/m^2-sec, can be calculated to be approximately 2.5 Ci. The specific activity of radon is about 150,000 Ci/g. Reasonably anticipated emissions from sources subject to Subpart W do not approach the 10 tpy threshold established in CAA § 112(a)(1) to define major sources.

[6] Pursuant to the Atomic Energy Act of 1954, as amended, the Nuclear Regulatory Commission defines ''source material'' as ''(1) Uranium or thorium or any combination of uranium or thorium in any chemical or physical form; or (2) Ores that contain, by weight, one-twentieth of one percent (0.05 percent), or more, of uranium or thorium, or any combination of uranium or thorium'' (10 CFR 20.1003). For a uranium recovery facility licensed by the Nuclear Regulatory Commission under 10 CFR part 40, ''byproduct material'' means the ''tailings or wastes produced by the extraction or concentration of uranium or thorium from ore processed primarily for its source material content, including discrete surface wastes resulting from uranium solution extraction processes'' (10 CFR 20.1003 and 40.4).)

these impoundments are subject to Subpart W until they begin closure.

The second standard applied to ''new'' impoundments constructed after December 15, 1989. The requirements applicable to new impoundments were work practice standards that regulated either the size and number of impoundments, or the amount of tailings that may remain uncovered at any time. After December 15, 1989, ''no new tailings impoundment can be built unless it is designed, constructed and operated to meet one of the following two work practices:

1. Phased disposal in lined tailings impoundments that are no more than 40 acres in area and meet the requirements of 40 CFR 192.32(a) as determined by the Nuclear Regulatory Commission. The owner or operator shall have no more than two impoundments, including existing impoundments, in operation at any one time.

2. Continuous disposal of tailings such that tailings are dewatered and immediately disposed with no more than 10 acres uncovered at any time and operated in accordance with § 192.32(a) as determined by the Nuclear Regulatory Commission.''

The basis of the work practice standards was to (1) limit the size of the impoundment, which limits the radon source; or (2) use the continuous disposal system, which prohibits large accumulations of dewatered uncovered uranium byproduct material or tailings, limiting the amount of radon released.

D. What changes to Subpart W did we propose?

Pursuant to CAA Section 112(d)(5), in the May 2, 2014 notice we proposed GACT-based standards for the affected sources at conventional uranium mills, ISL facilities and heap leach facilities. Subpart W has always applied to these sources; however, given the evolution of uranium recovery facilities over the last 20 years, we thought it appropriate to revise Subpart W to tailor the requirements of the NESHAP to the different types of facilities in existence at this time and reaffirm Subpart W's applicability to these facilities. For the conventional impoundments the GACT-based standards were based upon the requirements established in 1989. We also proposed to revise Subpart W to add appropriate definitions, standards and other requirements that are more applicable to HAP emissions at these different types of uranium recovery facilities. Specifically, we proposed to:

- Remove monitoring requirements for impoundments constructed prior to December 15, 1989 and to have these ''existing'' impoundments demonstrate compliance with the proposed GACT-based standards;
- clarify that any impoundment at a uranium recovery facility that contained uranium byproduct materials or tailings is regulated under Subpart W and subject to the liner requirements referenced at 40 CFR 192.32(a)(1), including ''evaporation'' or ''holding'' ponds;
- establish as GACT-based standards that these ''non-conventional'' or liquid-holding impoundments meet the design and construction requirements of 40 CFR 192.32(a)(1), with no size/area restriction or monitoring requirement, and that during the active life of the pond at least one meter of liquid be maintained in the pond;
- establish as GACT-based standards that heap leach piles meet the phased disposal management practice standard (which limits an owner/operator to no more than two operating heap leach piles of no more than 40 acres each at any time) and the design and construction requirements at 40 CFR 192.32(a)(1) as GACT-based standards, and maintain minimum moisture content of 30%;
- add a definition of ''standby'' to clarify the term and how it relates to the operational phase of an impoundment;
- amend the definition of ''operation'' of an impoundment so that it is clear when the owner or operator is subject to the requirements of Subpart W;
- add definitions of ''conventional impoundment,'' ''non-conventional impoundment,'' ''heap leach pile,'' ''uranium recovery facility'' and ''heap leach pile operational life'' to be consistent with the GACT-based standards;
- determine whether Subpart W adequately addresses protection from extreme weather events;
- revise 40 CFR 61.252(b) and (c) to accurately reflect that it is only 40 CFR 192.32(a)(1) that is applicable to Subpart W; and
- remove the phrase ''as determined by the Nuclear Regulatory Commission'' in 40 CFR 61.252(b)(1) and (2).

E. Comments on the Proposed Rule

The public comment period began on May 2, 2014 and was originally proposed to end on July 31, 2014. The comment period was extended by public request until October 29, 2014. We held two days of public hearings in Denver, CO on September 4 and 5, 2014. During the public comment period for the proposed rule, the EPA met with tribal leaders from the Ute Mountain Ute Tribe, consistent with the ''EPA Policy on Consultation and Coordination with Indian Tribes'' (*http://www.epa.gov/tribal/forms/consultation-and-coordination-tribes*). The consultation was held on July 10, 2014. The Tribe had numerous comments regarding the White Mesa uranium mill. Tribal land is several miles from the mill. The mill is the only operating conventional mill in the country, and the Tribe presented valuable information and comments for the rulemaking. The Tribe also raised enforcement issues that are concerns for the State of Utah and the EPA Region 8 office, but are not relevant to this rulemaking. The EPA has delegated to the State of Utah authority for implementation and enforcement of Subpart W (60 FR 13912, March 15, 1995).

The EPA received approximately 45 separate sets of comments on the proposed rule, including multiple submittals by the same author(s). The comments range in size from one page to several hundred pages, and in many cases contain dozens of individual comments. All told the EPA identified over 4,000 individual comments. A mass mailer that contains over one thousand signatures is also in the docket for this rulemaking (Docket No. EPA–HQ–OAR–2008–0218). The docket also includes the transcripts of the two public hearings held in Denver, CO on September 4 and 5, 2014. All of the comments received are in the docket for this rulemaking. All comments can be accessed electronically through the Federal Document Management System (FDMS), available at *http://www.regulations.gov*. This Web site provides instructions on how to access the electronic docket. Some submittals may be duplicated in FDMS, as a commenter may have used several methods to ensure the comments were received, such as statement at a public hearing, fax, email, U.S. mail, or directly through FDMS.

There are two primary mechanisms by which we explain the issues raised in public comments and our reactions to them. First, we discuss broad or major comments in the following sections of this document. Second, we are including in the docket a document, accompanying this action, entitled ''Summary of Public Comments and Responses.'' The Response to Comments document addresses all other significant comments on the proposal. We gave all the relevant comments we received, whether written or oral, consideration in developing the final rule.

III. What final amendments are we issuing with this action?

This action finalizes the EPA's determinations pursuant to its review of

Subpart W under CAA section 112(q)(1) to ''review, and if appropriate, revise'' NESHAPs promulgated prior to November 15, 1990. After review of the comments we determined that commenters provided reasons and presented information supporting revision to certain aspects of the proposed rule. In this section we describe the final amendments to Subpart W for this action and identify revisions made to the proposed rule in response to comments.

A. Application of Generally Available Control Technologies (GACT) to Uranium Recovery Facilities

We determined that the management practices promulgated in 1989 for conventional impoundments constructed after December 15, 1989 remain suitable for controlling radon from uranium byproduct material or tailings. We also concluded that these management practices qualify as elements of GACT-based standards for these impoundments. We further determined that there are management practices which constitute generally available control technologies that could be applied to non-conventional impoundments and heap leach piles. The final rule establishes the following elements as GACT-based standards for conventional impoundments constructed after December 15, 1989, non-conventional impoundments and heap leach piles:

- Construction of all impoundments containing or managing uranium byproduct material in accordance with the requirements in 40 CFR 192.32(a)(1);
- Operation of conventional impoundments in accordance with either the phased disposal or continuous disposal method;
- Operation of non-conventional impoundments such that solid materials in the impoundment are not visible above the liquid level, to be verified by daily visual inspection and documented by digital photograph no less frequently than weekly; and
- Maintenance of heap leach piles that have completed their operational life but have not yet entered closure in accordance with the phased disposal method (piles no larger than 40 acres in area and no more than two such piles at any time).

For conventional impoundments constructed before December 15, 1989, we retained the radon flux standard originally promulgated in 1989, and retained the requirement that the impoundments comply with the construction requirements in 40 CFR 192.32(a)(1), notwithstanding the exemption in § 192.32(a)(1) for impoundments constructed prior to the promulgation of 40 CFR part 192.

B. Definitions, References and Conforming Editorial Revisions

We are making revisions to several existing definitions and references, deleting a phrase and providing several new definitions. These revisions are:

- The definition of ''operation'' is revised as proposed;
- The definitions of ''continuous disposal,'' ''dewatered,'' ''existing impoundment,'' and ''phased disposal'' are revised to conform to the revised definition of ''operation'';
- Definitions of ''standby,'' ''conventional impoundment,'' ''non-conventional impoundment,'' ''heap leach pile,'' ''uranium recovery facility,'' and ''heap leach pile operational life'' are added as proposed, with minor conforming changes;
- The reference in the 1989 rule at 40 CFR 61.252(b) and (c) is revised to 40 CFR 192.32(a)(1), as proposed, to clarify that the liner requirements are the portion of interest; as finalized, the reference to 40 CFR 192.32(a)(1) is included in § 261.252(a)(2)(i), (a)(2)(ii), (b) & (c) and the reference at § 61.252(c) in the 1989 rule is incorporated into § 61.252(a)(1) in the final rule;
- The phrase ''as determined by the Nuclear Regulatory Commission'' is eliminated from 40 CFR 61.252(b)(1) and (2), as proposed (§ 61.252(a)(2)(i) and (ii) in the final rule);
- The definition of ''final closure'' is added for completeness and clarity, in response to comments regarding the applicability of Subpart W; and
- The definition of ''reclamation plan'' is added to further clarify the concept of closure.

C. What are the recordkeeping, notification and reporting requirements?

New and existing affected sources are required to comply with the existing requirements of the General Provisions (40 CFR part 61, subpart A). The General Provisions include specific requirements for notifications, recordkeeping and reporting, including provisions for notification of construction and/or modification and startup as required by 40 CFR 61.07, 61.08 and 61.09.

We are also requiring that all affected sources maintain certain records pertaining to the design, construction and operation of conventional impoundments, non-conventional impoundments and heap leach piles. These records must be retained at the facility and contain information demonstrating that the impoundments and/or heap leach pile meet the requirements in 40 CFR 192.32(a)(1), including but not limited to, all tests performed that prove the liner is compatible with the material(s) being placed on the liner. For non-conventional impoundments, this requirement also includes records showing compliance with the requirement to maintain liquid in the impoundment such that solid materials are not visible above the liquid.[7] Documents showing that the impoundments and/or heap leach pile meet the requirements in § 192.32(a)(1) are already required as part of the pre-construction application submitted under 40 CFR 61.07, so these records should already be available. Written and other records showing compliance with the liquid requirement for non-conventional impoundments can be created during the daily inspections of the tailings and waste retention systems required by the NRC (and Agreement States) under the inspection requirements of 10 CFR part 40, Appendix A, Criterion 8A.

Because we are retaining the radon flux standard for conventional impoundments in existence on December 15, 1989, we are also retaining the associated reporting requirements at 40 CFR 61.254 and these units must also comply with the revised recordkeeping requirements at 40 CFR 61.255, as applicable.

Because we are promulgating new recordkeeping requirements for uranium recovery facilities, we are required by the Paperwork Reduction Act (PRA) to prepare an estimate of the burden of such record-keeping on the regulated entity, in both cost and hours necessary to comply with the requirements. We have submitted the Information Collection Request (ICR) containing this burden estimate and other supporting documentation to the Office of Management and Budget (OMB). See Section VII.B for more discussion of the PRA and ICR.

We believe the record-keeping requirements promulgated today will not create a significant burden for operators of uranium recovery facilities. As described earlier, we are requiring retention of two types of records: (1) Records demonstrating that the impoundments and/or heap leach pile meet the requirements in § 192.32(a)(1) (*e.g.,* the design and liner testing information); and (2) records showing that liquid is maintained to cover any

[7] The liquid requirement pertains to having the level of liquid cover any and all solid uranium byproduct material or tailings. We do not anticipate a large quantity of solid uranium byproduct material or tailings in these non-conventional impoundments (EPA–HQ–OAR– 2008–0218–0088).

solid uranium byproduct material or tailings present in non-conventional impoundments.

Documents demonstrating that the affected sources comply with § 192.32(a)(1) requirements are necessary for the facility to obtain regulatory approval from the NRC (or an NRC Agreement State) and the EPA to construct and operate the affected sources (this includes any revisions during the period of operations). Therefore, these records will exist independent of Subpart W requirements and will not need to be continually updated as a result of this record-keeping requirement in Subpart W; however, we are including this record-keeping requirement in Subpart W to require that the records be maintained at the facility and available for inspection during its operational lifetime (in some cases the records might be stored at a location away from the facility, such as corporate offices). This might necessitate creating copies of the original records and providing a location for storing them at the facility.

Keeping a record to provide confirmation that liquid is maintained above the solid uranium byproduct material or tailings present in non-conventional impoundments should also be relatively straightforward. This would involve visual inspection and documentation, such as written notes and digital photographs with embedded date and time and other identifying metadata, using photographic capabilities that are readily available, such as smartphones or small digital cameras. As noted earlier, NRC and Agreement State licenses require operators to inspect the facility on a daily basis. Only minimal effort will be necessary to make observations of saturation and record the information in inspection log books that are already kept on site and available to inspectors. Inspections for saturation can occur during the daily inspections that are already required by NRC and Agreement States. The final rule requires that operators record written observations daily and collect photographic evidence of liquid depth no less frequently than weekly. Beginning on the effective date of this final rule, digital photographs are to be uploaded on at least a monthly basis to the EPA's Subpart W Impoundment Photographic Reporting (SWIPR) system. If that system is unavailable, digital photographs are to be retained by the facility and provided to the EPA or the authorized state upon request.

The final rule also includes a definition of "final closure" that refers to notification by the facility owner/operator. Subpart W applies to operating sources used to manage uranium byproduct material or tailings. Sources cease to be operating when they enter the closure process. The definition of "final closure" in the final rule clarifies that closure does not begin until the owner or operator provides written notification to the EPA and the NRC that the impoundment or heap leach pile is no longer used for its operational purpose and is being managed under an approved reclamation plan for that impoundment or pile, or the facility closure plan. Such notifications should involve limited effort on the part of facility owners or operators. A reclamation plan is required by NRC regulation and is not a new requirement under Subpart W.

We estimate the burden in hours and cost for uranium recovery facilities to comply with the proposed recordkeeping and notification requirements are as follows:

TABLE 3—BURDEN HOURS AND COSTS FOR RECORDKEEPING REQUIREMENTS

[Annual figures except where noted]

Activity	Hours	Costs
Maintaining Records for the 40 CFR 192.32(a)(1) requirements	*20	*$1,430
Verifying saturation for non-conventional impoundments, including collecting and uploading digital photographs	291	14,650

*These figures represent a one-time cost to the facility.

IV. What is the rationale for our final decisions and amendments to Subpart W?

A. Legal Authorities and GACT

1. What is the legal authority for GACT based standards and management practices in the final rule?

Section 112(q)(1) of the CAA requires that NESHAPs "in effect before the date of enactment of the Clean Air Act Amendments of 1990 [Nov. 15, 1990] . . . shall be reviewed and, if appropriate, revised, to comply with the requirements of subsection (d) of . . . section [112]." The EPA promulgated 40 CFR part 61, subpart W, "National Emission Standards for Radon Emissions from Operating Mill Tailings," ("Subpart W") on December 15, 1989.[8] The EPA conducted this review of Subpart W under CAA section 112(q)(1).

Section 112(d) establishes the requirements for emission standards for HAP promulgated under section 112. It establishes different requirements for major sources and area sources. A major source is any stationary source that emits or has the potential to emit 10 tpy or more of any single HAP or 25 tpy or more of any combination of HAPs. An area source is a stationary source of HAP that is not a major source. See Sections II.B and IV.A.2 for discussion of area sources as they relate to Subpart W.

Pursuant to CAA section 112(d), standards for major sources "shall require the maximum degree of reduction in emissions of the hazardous air pollutants . . . that the Administrator . . . determines is achievable." For area sources, the Administrator has the discretion under CAA section 112(d)(5) to set standards based on GACT in lieu of MACT. Specifically, CAA section 112(d)(5) provides that the Administrator may elect to promulgate standards or requirements for area sources "which provide for the use of generally available control technologies or management practices by such sources to reduce emissions of hazardous air pollutants."

Section 112(q)(1) does not dictate how the EPA must conduct its review of those NESHAPs issued prior to 1990. Rather, it provides that the Agency must review, and if appropriate, revise the standards to comply with the requirements of section 112(d). Determining what revisions, if any, are appropriate for these NESHAPs is best assessed through a case-by-case consideration of each NESHAP. In other rulemakings, the EPA has determined that GACT standards are appropriate for

[8] On April 26, 2007, CCAT and Rocky Mountain Clean Air Action filed a lawsuit against the EPA (EPA–HQ–OAR–2008–0218–0013) for the EPA's alleged failure to review and, if appropriate, revise NESHAP Subpart W under CAA section 112(q)(1). A settlement agreement was entered into between the parties in November 2009 (EPA–HQ–OAR–2008–0218–0020, –0021).

a number of different area sources, including, for example, industrial, commercial and institutional boilers (promulgated at 40 CFR part 63, subpart JJJJJJ) and oil and natural gas production facilities (promulgated at 40 CFR part 63, subpart HH). Using a GACT evaluation, the EPA has historically established both emission standards and management practices, as appropriate.

As explained below, in this case, we have reviewed Subpart W and are revising the standards consistent with section 112(d)(5), which addresses standards for area sources. After our review, we determined it was appropriate to revise Subpart W to clarify the applicability of the rule to non-conventional impoundments and heap leach piles and promulgate standards that are more appropriate for controlling radon emissions at those sources. All units regulated by Subpart W are area sources and we determined that promulgating GACT-based standards under CAA section 112(d)(5) is appropriate for these sources. Consistent with section 112(q)(1) we are revising Subpart W to comply with the requirements in section 112(d) relating to emission standards for area sources and are thus revising the Subpart W standards to reflect GACT-based standards.

2. What key comments did we receive on our legal authorities and the GACT approach?

We received several comments challenging our use of GACT for this rulemaking. Commenters specifically asserted that the EPA may not set GACT-based standards for sources subject to Subpart W and challenged our conclusion that facilities subject to Subpart W are area sources.

Commenters further argued that the work practices instituted for conventional impoundments in 1989, which we are finalizing today as GACT-based standards, are contrary to CAA section 112(h), which allows the EPA to promulgate work practices in lieu of MACT standards only when ''it is not feasible in the judgment of the Administrator to prescribe or enforce an emission standard.''

We summarize below a number of comments received on this topic and present our responses. Additional comment responses on this topic appear in the Response to Comments document in the docket for this rulemaking.

Comment: A commenter argued that uranium recovery operations should be considered, by definition, major sources of hazardous air pollutants and should be subject to major source requirements. The commenter further stated that the EPA's document Background Information for Proposed Area Source Standards is misleading because it uses the standard major source threshold at CAA section 112(a)(1), that any stationary source that emits or has the potential to emit 10 tpy or more of any single HAP or 25 tpy or more of any combination of HAPs, to support its conclusion that uranium recovery facilities regulated under Subpart W are area sources. The commenter stated that radon is not measured in tpy and that the CAA section 112 threshold of 10 or 25 tpy was not intended to apply to radon or other radionuclides.

Response: Under section 112(a)(1) of the CAA major sources are defined as stationary sources or groups of stationary sources that emit, or have the potential to emit, any single HAP at a rate of 10 tpy or more, or 25 tpy or more of any combination of HAP. An area source, in turn, is any stationary source of HAP that is not a major source. CAA section 112(a)(2). The statute also allows the EPA to establish lower thresholds, or for radionuclides to establish different criteria based on the characteristics of the air pollutant and relevant factors, but the statute is clear on its face that the EPA is not required to set alternative criteria. CAA section 112(a)(1). In the absence of alternative criteria, the statutory criteria of 10 tpy of a single HAP or 25 tpy of a combination of HAP applies, and any source that does not meet or exceed those thresholds is an area source. By allowing the EPA to set different criteria only for radionuclides, the statute implicitly recognizes that an alternative to the statutory thresholds based on tpy may be appropriate for sources of radionuclides. Nonetheless, the statute neither requires the EPA to set alternative criteria for defining major sources of radionuclides, nor obligates the EPA to designate any or all radionuclide sources as major sources. In sum, the statute explicitly leaves open the possibility that all sources of radionuclides will be regulated as area sources unless the EPA decides to establish alternate criteria. Moreover, even if the EPA had decided to set alternate criteria, nothing in the CAA would have required the EPA to establish criteria that would have the effect of making some sources that manage uranium byproduct material or tailings major sources of HAP. Thus, there is no basis for the commenter's assertion that uranium recovery operations should be considered, by definition, major sources of HAP.

In addition, regulating sources that manage uranium byproduct material or tailings as area sources does not constrain the EPA's regulatory options. For area sources, the EPA can set GACT standards under CAA section 112(d)(5) or MACT standards under CAA section 112(d)(2). EPA's decision to retain this flexibility by regulating these sources as area sources is reasonable and consistent with the discretion given to the EPA by the statutory text.

It is also worth noting that, under Subpart W, radon emissions from sources that manage uranium byproduct material or tailings are regulated regardless of whether they qualify as major or area sources. For source categories not regulated before 1990, the EPA has discretion to decide whether to list and thus whether to regulate area sources. Radon emissions from uranium byproduct material or tailings, however, were regulated prior to 1990 and CAA section 112(q) explicitly provides that such standards remain in force and effect after the effective date of the 1990 CAA Amendments. The distinction between major and area sources thus does not affect whether sources subject to Subpart W are regulated under CAA section 112. Nothing in CAA section 112(q)(1) or CAA section 112(d) limits EPA's discretion to set standards under CAA section 112(d)(5), for sources regulated prior to the 1990 CAA Amendments whose emissions do not exceed the major source threshold established by Congress.

Comment: Commenters stated that the EPA must establish a source category pursuant to CAA section 112(c)(1) before promulgating CAA section 112(d) standards. One of these commenters cites to a 2007 EPA rulemaking which stated that listing pursuant to section 112(c) is a critical aspect and a condition precedent to issuing CAA section 112(d)(5) standards. Commenters also argued that the EPA must determine all HAPs present at uranium recovery facilities before the EPA can establish a source category, develop criteria to differentiate between major and area sources of radionuclides, and promulgate emission standards, whether MACT or GACT.

Another commenter asserted that because CAA section 112(q) requires pre-1990 regulations to be reviewed and, if appropriate, revised in accordance with the requirements of subsection (d), the revision must comply with all applicable requirements in CAA section 112, including all parts of CAA section 112 enacted as part of the 1990 CAA Amendments.

One commenter also argued that the EPA must establish a source category or subcategory before promulgating standards under CAA section 112(d)(5) for facilities licensed to manage uranium byproduct materials. The comments state that the EPA has not complied with the requirements of CAA section 112 and has not taken the requisite preliminary actions and evaluations to support establishing revised standards for uranium recovery facilities, specifically GACT. Another commenter stated that the EPA has no basis for setting GACT standards in lieu of MACT standards.

Response: The EPA originally promulgated Subpart W in 1989, before Congress enacted the 1990 CAA Amendments. The 1990 Amendments introduced the requirement to list major and area sources of HAPs. *See* CAA sections 112(c)(1) & (c)(3), 42 U.S.C. 7412(c)(1) & (c)(3). The 1990 Amendments also added CAA section 112(q), which explicitly provides that section 112 standards in effect prior to the date of enactment of the 1990 CAA Amendments shall remain in force and effect after that date. CAA section 112(q)(1) also provides that: ''Each [standard in effect before the enactment of the CAA Amendments of 1990] shall be reviewed and, if appropriate, revised to comply with the requirements of subsection (d) of this section . . .'' In sum, Congress clearly intended that (1) standards promulgated prior to 1990 remain in effect; and (2) the EPA may update the standards, as appropriate. However, there is no indication that Congress intended to require that the EPA go through the process of listing source categories that were subject to regulations prior to 1990 and thus, effectively already ''listed.'' CAA section 112(c)(4) provides that, ''The Administrator may, in the Administrator's discretion, list any category or subcategory of source previously regulated under this section as in effect before November 15, 1990.'' The EPA reviewed Subpart W pursuant to section 112(q)(1) and has not listed uranium recovery operations pursuant to section 112(c).

The EPA disagrees with the commenters' assertions that the EPA must list the regulated source category pursuant to section 112(c) before revising the existing Subpart W. Section 112(q)(1), on its face, does not require the EPA to list such sources pursuant to subsection (c) as part of a section 112(q) review. It does not contain any cross reference to the listing provisions of section 112(c). Instead, section 112(q) requires revision, if appropriate, in accordance with subsection (d)—the subsection that governs standard setting under section 112. Moreover, section 112(c)(4) explicitly grants the Administrator discretion to decide whether or not to list categories and subcategories of sources regulated under section 112 prior to the 1990 CAA Amendments. Thus, neither of the provisions addressing standards promulgated prior to the 1990 CAA Amendments, nor any other statutory provision, support the commenters' assertion that listing under section 112(c) is a necessary part of a section 112(q) review.

There is also no basis for commenters' statements that the EPA must determine all HAPs present at uranium recovery facilities and develop criteria to differentiate between major and area sources of radionuclides before it can promulgate emission standards, whether MACT or GACT. The EPA's task under section 112(q) is to review and, if appropriate, revise standards in effect before the date of enactment of the 1990 CAA Amendments. Prior to the 1990 CAA Amendments, section 112 standards were promulgated for individual pollutants and Subpart W only establishes standards for radon resulting from management of uranium byproduct material or tailings at uranium recovery operations. The EPA's obligation under section 112(q) therefore is limited to reviewing and, if appropriate, revising standards for radon resulting from management of uranium byproduct material or tailings at uranium recovery operations. The statutorily required review does not encompass listing the source category under section 112(c) or evaluating HAPs not previously regulated under the subpart being reviewed. As explained in the previous response, the statute also does not require the EPA to set alternate criteria for distinguishing between major and area sources of radionuclides.

The commenter's reliance on a 2007 rulemaking is misplaced. In that rulemaking, the EPA promulgated NESHAPs for the first time for the identified source categories. The present rulemaking is governed by CAA section 112(q)(1), which only requires that the review and revision comply with the standard setting requirements of subsection (d). As explained above, the section 112(q)(1) review does not require listing the source category under section 112(c). The 2007 rulemaking set new standards and was not subject to the narrow review requirements of CAA section 112(q)(1). Further, CAA section 112(c)(4) explicitly provides the EPA with discretion regarding whether to list source categories regulated prior to the 1990 CAA Amendments. CAA section 112(c)(4) applies to the sources subject to Subpart W but was not applicable to the sources impacted by the 2007 rulemaking. For these reasons, the statements made in the 2007 rulemaking are inapposite.

The commenter's assertion that the EPA must revise Subpart W to comply with all provisions of section 112 is also based on an overly broad reading of CAA section 112(q)(1). The statute only instructs the EPA to ''review[ ] and, if appropriate, revise[ ], to comply with the requirements of subsection (d) of this section . . .'' It does not require the EPA to revise the pre-1990 rules to comply with every provision in the section 112 CAA Amendments of 1990. Indeed, to read section 112(q)(1) as requiring the EPA to revise the rules to comply with all provisions in section 112 would be to read the reference to subsection (d) out of the statute.

Finally, listing a source category under section 112(c) is not a pre-requisite to establishing GACT standards for area sources as part of a section 112(q) review. As explained in the previous response, section 112(d)(5) allows the EPA to set GACT instead of MACT standards for area sources. Specifically, CAA section 112(d)(5) provides that with respect only to categories and subcategories of area sources listed pursuant to section 112(c), the Administrator may, in lieu of setting standards under sections 112(d)(2) and 112(f), decide to promulgate standards based on generally available control technologies. Such standards are commonly referred to as GACT standards.

CAA section 112(d)(5) is ambiguous to the extent that it is not clear whether it provides that the EPA may set GACT standards ''only'' for ''area sources'' or whether it also prohibits the EPA from setting section 112(d)(5) GACT standards for area sources regulated under section 112 but not listed pursuant to section 112(c)—that is, area sources that are regulated pursuant to section 112 standards promulgated before the 1990 CAA Amendments but not added to the section 112(c) list. For the reasons explained below, the EPA does not interpret section 112(d)(5) as limiting its discretion to promulgate GACT standards as part of a section 112(q) review simply because the area source category has not been added to the section 112(c) list.

As an initial matter, the specific statutory provisions addressing section 112 standards that pre-dated the 1990 Amendments appear in sections 112(q)(1) and 112(c)(4). As discussed above, these provisions require the EPA to review and, if appropriate, revise such standards to comply with the requirements of subsection (d) and also establish that the EPA has discretion to decide whether or not to list source categories under section 112(c). In the event of any conflict with other more general provisions in section 112, the more specific provisions of sections 112(q)(1) and 112(c)(4) govern.

The general standard setting obligation in section 112(d)(1) also provides helpful context. Specifically, CAA section 112(d)(1) states that ''The Administrator shall promulgate regulations establishing emission standards for each category or subcategory of major sources and area sources of hazardous air pollutants listed for regulation pursuant to subsection (c) of this section . . .'' Section 112(d)(1) grants the EPA authority to set emission standards under both section 112(d)(2) (MACT standards) and section 112(d)(5) (GACT standards). Like section 112(d)(5), it cross references the listing provision of subsection (c). Neither provision explicitly addresses how it applies in the context of a section 112(q) review. And neither provision explicitly overrides either the section 112(q) review requirements or the discretion granted to the Administrator under section 112(c)(4). Therefore, for standards promulgated prior to the 1990 CAA Amendments, it is reasonable for the EPA to interpret sections 112(d)(1) and (d)(5) to not require listing pursuant to § 112(c) before the EPA can review the standards under section 112(q)(1) and, if appropriate, revise them to comply with subsection (d). In contrast, if the EPA were to take the approach suggested by commenters, and read the cross references to subsection (c) in sections 112(d)(1) and 112(d)(5) as a limitation on the EPA's authority under section 112(q) to revise standards to comply with subsection (d) it would be inconsistent with CAA sections 112(q)(1) and 112(c)(4).

Given the statutory context outlined above, for this CAA section 112(q)(1) review, it is reasonable for the EPA to interpret CAA section 112(d)(5) as restricting the EPA's ability to set GACT standards to ''only area sources,'' but not prohibiting the EPA from setting GACT standards as part of a section 112(q) review simply because the area source category is not listed pursuant to subsection (c).

Comment: Several commenters argued that the EPA improperly proposed to promulgate design and work practice standards in lieu of emissions standards. Specifically, commenters stated that the EPA cannot promulgate design and work practice standards without the Administrator first making a finding pursuant to CAA section 112(h) that emission standards are not feasible. Commenters took the position that the EPA has not and cannot make a finding pursuant to CAA section 112(h) that radon emissions standards are not feasible at uranium recovery facilities. These and another commenter assert that the EPA has not and cannot make the ''not feasible'' showing, so the EPA must promulgate an emissions standard.

One of these commenters stated that the EPA has no legal basis for the promulgation of a design, equipment, work practice, or operational standard, or combination thereof, in lieu of a radon emission standard, because design, equipment, work practice, or operational standards are meant to supplement, not replace, a standard that places specific numerical limitations on HAP emissions. The commenter also asserts that the EPA has no legal basis for eliminating the emission standard for existing mill tailings impoundments.

The other commenter pointed to text from the legislative history of the 1990 CAA Amendments and stated that work practice standards must achieve the same or greater level of emissions reduction as a numerical emission standard. The commenter argues that radon emissions will be higher under the GACT standards than they would be under a numerical emission standard and therefore the EPA should promulgate an emission standard.

Response: The EPA disagrees with these comments. The statute does not require the EPA to make a finding pursuant to CAA section 112(h) prior to promulgating management practices for area sources pursuant to section 112(d)(5). While section 112(d)(2) requires the EPA to make such a finding prior to setting work practice standards in lieu of an emission standard, section 112(d)(5) contains no such requirement.

Instead, CAA section 112(d)(5) provides the EPA with discretion regarding the type of standards it sets for area sources by permitting the EPA to set standards or requirements ''which provide for the use of generally available control technologies or management practices'' (42 U.S.C. 7412(d)(5)). The EPA determined that the management practices required in this final rule constitute generally available management practices and effectively control radon emissions from conventional impoundments constructed after December 15, 1989, non-conventional impoundments and heap leach piles.

Because CAA section 112(d)(5) provides the EPA with the option of establishing management practices, the EPA was not required to make a showing under CAA section 112(h) that an emissions standard is not feasible before we set management practices. Further, CAA section 112 does not provide that management practices must supplement emission standards; the EPA may set management practices to control emissions pursuant to CAA section 112(d)(5).

With respect to existing conventional impoundments in existence on December 15, 1989, the EPA is retaining the emissions standard originally promulgated in 1989. During the comment period, the EPA learned that the information on which it relied when proposing to remove the emission standard requirement for existing conventional impoundments designed or constructed prior to December 15, 1989 was not accurate. Because the conventional impoundments in existence on December 15, 1989 are constructed in such a way that they are unable to comply with the standards being promulgated for conventional impoundments constructed after December 15, 1989, the EPA determined that it is appropriate to retain the emissions standard and monitoring requirement for conventional impoundments in existence on December 15, 1989. Because these units have been subject to a radon flux standard of 20 pCi/m^2-sec since 1989, this method of compliance is generally available and effectively regulates radon emissions from these units.

The EPA evaluated all types of units regulated by Subpart W: Conventional impoundments in existence as of December 15, 1989, conventional impoundments constructed after December 15, 1989, non-conventional impoundments, and heap leach piles. Each type of unit has different characteristics. Also, not all units were subject to the same requirements at the time of their construction, and the feasibility of compliance with emissions standards and/or management practices also varies between types of units. The EPA took these variations into consideration when we conducted our GACT analysis for each type of unit. Because the three remaining conventional impoundments in existence as of December 15, 1989 were subject to different construction requirements than units constructed after that date, and are not amenable to the management practices established in 1989 for those newer units, different standards are appropriate.

The legislative history language referenced by the commenter is concerned with the stringency of work practice standards promulgated under CAA section 112(h), when an emissions standard is not feasible. This passage of the legislative history is not discussing the stringency of management practices promulgated under CAA section 112(d)(5) and thus is not relevant. Further, the commenter's claim that radon emissions will be higher under the GACT-based standards than they would be under a numerical emission standard is speculative. The commenter has not shown that the management practices promulgated in Subpart W will not effectively result in the same emissions reductions that would be achieved if the EPA had set a MACT standard under CAA section 112(d)(2). The GACT-based standards finalized in the rule will effectively control radon emissions from uranium byproduct material or tailings.

Comment: Several commenters challenged the EPA's authority to regulate impoundments associated with management of process liquids or effluents, referred to as non-conventional impoundments in the Subpart W rulemaking. One commenter submits that Subpart W does not apply to evaporation ponds at currently operating and future operating uranium recovery facilities, specifically in-situ facilities, because of the significant amount of process or waste water present. This and another commenter assert that evaporation ponds should not be regulated in Subpart W because the liquid cover substantially eliminates radon emissions. The second commenter further supports excluding evaporation ponds because the original 1989 rulemaking stated that science did not support the EPA exercising jurisdiction over fluid retention impoundments.

This commenter similarly argues that the EPA has no legal or regulatory bases to apply Subpart W to evaporation ponds at uranium recovery facilities. Further, the commenter states that after 20 years of consistent interpretation that Subpart W is only applicable to uranium mill tailings impoundments, the EPA is now asserting that Subpart W applies to evaporation ponds at in-situ recovery and conventional mill tailings facilities. The commenter argues that the EPA's position is inconsistent with the language and the rulemaking history associated with Subpart W since the regulations discuss uranium mill tailings ''piles'' and the rulemaking record states that the radon cover requirements in Subpart W's work practice standards are not intended to apply to such fluid retention impoundments.

The commenter also challenges that evaporation ponds are not covered by Subpart W because the specific examples in the regulations do not include evaporation ponds.

Another commenter argues that the liquid impoundments should not be regulated as tailings impoundments and should not be subject to 40 CFR part 192.

Alternatively, one commenter supported the EPA's confirmation that ISL facilities and liquid impoundments are subject to the EPA's CAA NESHAP jurisdiction. The commenter also stated that where the rule does not include emissions limits confirmed by monitoring and reporting requirements, the EPA has not carried out its CAA duty to minimize or eliminate radon emissions.

Response: Non-conventional impoundments (which include evaporation and holding ponds) are associated with all types of uranium recovery facilities, but especially ISL facilities. Non-conventional impoundments receive liquids containing uranium byproduct material or tailings from conventional milling, ISL operations or heap leach piles and the uranium byproduct material or tailings may be suspended or dissolved in the liquids. Some portion of the material will precipitate out and settle on the bottom of the impoundment. In fact, the liquid itself constitutes uranium byproduct material or tailings because it is a waste from the concentration or extraction process.

Commenters' arguments that the EPA lacks authority to regulate non-conventional impoundments lack merit. As an initial matter, commenters do not and could not support their assertion that the EPA lacks legal authority to regulate these impoundments. Radionuclides, including radon, are listed as HAPs in CAA section 112(b)(1), and the EPA has authority under sections 112(d) and 112(q) to regulate radionuclide emissions from sources that manage uranium byproduct materials or tailings.

In addition, commenters' alternate arguments, that these impoundments are not currently and should not be regulated by Subpart W, are incorrect. As promulgated in 1989, Subpart W requirements specifically apply to the structures at the uranium recovery facilities that are used to manage or contain the uranium byproduct material or tailings during and following the processing of uranium ores. 40 CFR 61.250. Common names for these structures may include, but are not limited to, impoundments, tailings impoundments, evaporation or holding ponds, and heap leach piles. However, the name itself is not important for determining whether Subpart W requirements apply to that structure; rather, applicability is based on what these structures contain. Uranium byproduct material or tailings produced by ISL is covered by the definition of uranium byproduct material or tailings included in the 1989 Subpart W NESHAP, which is not altered by this final rule.

The EPA understood that there was previously some confusion regarding the applicability of Subpart W to different units that manage uranium byproduct material or tailings, including impoundments and evaporation ponds at ISL facilities (non-conventional impoundments) and heap leach facilities. The EPA also acknowledges that the provisions of the 1989 rule applied imperfectly to these units. The industry is shifting toward ISL as the dominant method of uranium recovery and, while it is not expected to be as significant a source of radon emissions as conventional impoundments, it is reasonable for the EPA, as part of this section 112(q) review, to clarify that the standards in Subpart W apply to non-conventional impoundments. To eliminate any potential confusion, the final rule reaffirms that Subpart W continues to regulate radon emissions from all management of uranium byproduct material or tailings at uranium recovery facilities. Subpart W has always applied to these units; this final rule clarifies that applicability and confirms that these impoundments are covered by Subpart W by establishing management practices tailored to non-conventional impoundments.[9]

The EPA has authority to interpret its own regulations, *Auer* v. *Robbins,* 519 U.S. 452 (1992), and may clarify its interpretation when justified. In this rulemaking, the EPA did not revise its interpretation of Subpart W, rather we clarified the applicability of the regulations. Moreover, the EPA also provided notice and opportunity for comment on these clarifications.

Commenters incorrectly state that evaporation ponds are not covered by Subpart W because evaporation ponds are not used as an example in the regulation. Similarly, commenters' claims that the radon cover requirements are not intended to apply

[9] Note that the BID supporting the 1989 final rule stated: ''The licensed uranium mill tailings source category comprises the tailings impoundments *and evaporation ponds* created by conventional acid or alkaline leach processes at uranium mills licensed by the Nuclear Regulatory Commission (NRC) or the Agreement States'' (BID Volume 2, Risk Assessments, EPA/520/1–89–006–1, page 9–1, emphasis added). The risk assessment evaluated the contribution of evaporation ponds to total radon emissions at some, but not all, of the operating and standby mills. If allowed to dry out, evaporation ponds could represent a non-negligible portion of the overall radon emissions subject to control under Subpart W. See Tables 9–2, 9–3, 9–28.

to fluid retention impoundments is inaccurate.[10] As explained previously, the determining factor of whether evaporation ponds are subject to Subpart W and whether the radon cover requirements apply is whether the unit contains uranium byproduct material or tailings. Since promulgated in 1989, Subpart W has applied to facilities licensed to manage uranium byproduct material or tailings; units that manage uranium byproduct material or tailings must comply with the applicable GACT-based standard.

In addition, to the extent commenters are challenging the EPA's interpretation of the applicability provisions in 40 CFR part 192, such comments are beyond the scope of this rulemaking and the EPA has no obligation to respond. This rulemaking addresses only Subpart W. The EPA's May 2, 2014 proposal did not reopen or take comment on any aspects of part 192. The applicability provisions of part 192 appear at 40 CFR 192.00. Subpart W does not expand the scope of applicability of part 192 as liners meeting the requirements at 40 CFR 192.32(a)(1) are already mandated by other regulations (79 FR 25407).

In response to one commenter's argument that Subpart W should not regulate evaporation ponds at ISL facilities because of the amount of water present in the ponds, the EPA disagrees. While the EPA agrees that the presence of sufficient liquid significantly reduces the radon emissions, that is not itself a reason to exclude evaporation ponds from regulation as a pond may still contain uranium byproduct material or tailings, which have the potential to emit radon. As stated above, the presence of uranium byproduct material or tailings in the pond determines whether the pond is regulated by Subpart W. The management practices the EPA is promulgating in Subpart W ensure that the radon emissions are continuously effectively controlled. The EPA requires that owners and operators of non-conventional impoundments ensure that the uranium byproduct material or tailings remains saturated, meaning that the material is covered in liquid, which will effectively control radon emissions from these impoundments.

The EPA acknowledges and appreciates the commenter's support of the EPA's clarification that uranium in-situ leach facilities are subject to Subpart W. The EPA's response to the comment regarding the requirement to establish emissions limits confirmed by monitoring and reporting requirements is contained in the response to the previous comment.

Comment: Commenters questioned the appropriateness of including groundwater protection requirements in a NESHAP promulgated under the CAA since they do not affect air pollution. Further, one commenter added that the rule is unnecessary because it is designed to regulate HAPs yet it incorporates groundwater protection standards. The commenters stated that the additional requirements for fluid retention impoundments imposed by the imposition of 40 CFR 192.32(a)(1) and, by extension 40 CFR 264.221, are not justified.

Both commenters asserted that if the NRC believed that the imposition of the part 192 requirements were justified, the NRC would have explicitly referenced 40 CFR 192.32(a)(1) and by extension 40 CFR 264.221 in 10 CFR part 40 Appendix A, but it does not.

Alternatively, another commenter asserted that the EPA cannot allow a situation where the reduction of radon emissions comes at the expense of increased pollution of the groundwater or surface water. The commenter is concerned that the rule works at cross-purpose with 40 CFR part 192.

Response: The EPA may evaluate the non-air quality impacts of rules issued under CAA section 112. CAA section 112(d)(2) explicitly provides that the EPA has authority to consider non-air quality health and environmental impacts when promulgating standards under that section. For area sources, the EPA may promulgate standards under CAA section 112(d)(5) in lieu of CAA section 112(d)(2). Since the CAA provides for the EPA to consider such impacts under CAA section 112(d)(2), it is reasonable for the EPA to consider such impacts under CAA section 112(d)(5). Further, the CAA does not prohibit the EPA from considering non-air quality health and environmental impacts for CAA section 112(d)(5) standards. Additionally, we believe the Legislative History of the CAA Amendments of 1990 provides for the EPA generally taking environmental protection into account when promulgating standards for area sources (Senate Report Number 101–228, December 20, 1989).

Subpart W does not regulate groundwater or establish groundwater protection standards. Groundwater contamination is controlled by pre-existing regulations prepared under the Uranium Mill Tailings Radiation Control Act of 1978 (UMTRCA). During Subpart W rule development, the EPA considered the other regulations that impact sources subject to Subpart W and understood that surface impoundments subject to Subpart W are also subject to the standards in 40 CFR part 192 and part 264, subpart K. The part 192 groundwater protection regulations and liner requirements independently apply to the units subject to Subpart W. Through part 192 and part 264, subpart K, requirements were already in place at the time Subpart W was originally promulgated to protect groundwater from sources that manage uranium byproduct material or tailings. As the EPA explained in 1986, ''potential effects of various alternatives on ground water were considered as part of the analysis of the impacts of this rule, since EPA has a responsibility to consider the impacts that its rules may have on the total environment. In part, this is done to ensure that regulations do not control pollution in one environmental medium only to degrade another'' (51 FR 34058–34059). See also 54 FR 51680.

The EPA has considered the potential effects on groundwater from industry practices under this rule. The EPA also considered the separate, already existent, groundwater protection requirements when initially developing Subpart W. The EPA recognized that if water cover is maintained or expanded in order to limit radon emissions to the atmosphere, the potential for impacting groundwater increases because of the greater hydraulic head. It thus reasonably considered the extent to which existing requirements would limit potential groundwater impacts in determining reasonable management practices to limit radon emissions to the ambient air.

Additionally, the liner requirements have a direct connection to the effectiveness of Subpart W in limiting radon emissions from uranium byproduct material or tailings. It is well established that moisture reduces the rate of radon emanation. An unlined or poorly lined impoundment is more likely to lose moisture through the bottom of the impoundment. This not only increases the potential for ground water contamination, but increases the potential for the uranium byproduct material or tailings in the impoundment to dry out, thereby increasing radon emissions. Thus, the liner requirements

[10] In amending 40 CFR part 192 pursuant to an MOU with NRC, EPA stated the following in response to comments that evaporation ponds should remain open after emplacement of the final radon barrier: ''EPA reiterates that the Agency does not intend the expeditious radon cover requirements to extend to areas where evaporation ponds are located, even if on the pile itself, *to the extent that such evaporation pond is deemed by the implementing agency (NRC or an affected Agreement State) to be an appropriate aspect to the overall remedial program for the particular site*'' (emphasis added) (58 FR 60354, November 15, 1993).

boost the impoundment's ability to retain moisture and continue to control radon emissions. Because the liner requirements directly relate to the effectiveness of controlling radon emissions by retaining moisture and because the EPA considered the existing groundwater protection standards when evaluating the non-air environmental impact of using water to control air emissions, it was appropriate to acknowledge those standards and incorporate them into Subpart W. Further, nothing in this final action expands the applicability of 40 CFR part 192 to sources that would not otherwise be covered by part 192. See also Section IV.F.1.b.

Comments on the NRC regulations contained in 10 CFR part 40 Appendix A are beyond the scope of this rulemaking and, in any event, the regulations in 10 CFR part 40 Appendix A speak for themselves. In 10 CFR part 40 Appendix A, the NRC references and recognizes that the standards promulgated by EPA in 40 CFR part 192 achieve the minimum level of stabilization and containment of the sites concerned and a level of protection for public health, safety, and the environment from radiological and nonradiological hazards associated with the sites. Additionally, 10 CFR part 40 Appendix A incorporates the basic groundwater protection standards imposed by the EPA in 40 CFR part 192 which apply during operations and prior to the end of closure. 10 CFR part 40 Appendix A requires groundwater monitoring to comply with these standards.

In response to the other commenter, the EPA considered the regulations that independently apply to sources subject to Subpart W. The EPA recognized that the scope of units required to operate with liners pursuant to part 192 is consistent with the Subpart W regulations. Subpart W does not lessen the effectiveness of part 192.

Comment: Commenters concurred with the EPA's authority under Section 112 of the CAA to regulate radionuclide emissions at holding or evaporation ponds at conventional mills, at ISL facilities and at heap leach facilities. However, the commenters contend that the EPA should not only regulate uranium byproduct material or tailings in conventional impoundments, liquid effluent ponds, and heap leach piles, but should also regulate the large amounts of radon emitted from wellfields and other parts of ISL operations. One commenter used the Smith Ranch-Highland operation in Wyoming as an example.

The commenters also advocated for the EPA expanding the scope of operations covered by Subpart W at heap leach facilities. Specifically, the commenters encouraged the EPA to regulate radon emissions from the time ore is placed on the pile, to the placement of a final radon barrier, including periods of standby, and time periods prior to and during the placement of lixiviant on a heap leach pile. The commenters also took the position that heap leach piles that are drying out should be subject to a radon emission standard.

Response: The EPA acknowledges and appreciates the commenters' concurrence with the EPA's authority to regulate radionuclide emissions at holding or evaporation ponds at conventional mills, at ISL facilities and at heap leach facilities.

When the EPA initially promulgated Subpart W in 1986, we identified radon as the radionuclide released to air that presented the highest risk at uranium recovery facilities and determined that units managing uranium byproduct material or tailings were the most significant source of radon emissions (51 FR 34056). Since 1986 and re-promulgation in 1989, Subpart W has only regulated units that manage uranium byproduct material or tailings at uranium recovery facilities (40 CFR 61.250). Other potential emission points in these facilities were not previously the subject of Subpart W regulation and were not assessed for the 1989 rulemaking. The EPA's CAA section 112(q) review of Subpart W was limited to the existing standard. Because Subpart W did not regulate other potential emission points, the EPA did not include any other potential emission points in its CAA section 112(q) review. In this final rule, the EPA continues to regulate the management of uranium byproduct material or tailings from conventional mills, from ISL facilities and from heap leach piles.

With respect to regulation of heap leach piles, the EPA similarly retained the scope of Subpart W's applicability to sources that manage uranium byproduct material or tailings from heap leach operations. The EPA determined that, for purposes of Subpart W, while lixiviant is being sprayed on heap leach piles, the piles are part of the milling process rather than an impoundment whose function is to manage uranium byproduct material or tailings. The final rule does, however, cover the other impoundments used to manage the uranium byproduct material or tailings associated with the heap leaching operation and covers the heap leach pile during the period between the conclusion of processing and the day that final closure begins. See Section IV.D.

Comment: Several commenters stated that the NRC has exclusive jurisdiction over the radiological and non-radiological aspects of uranium mill operations and the nuclear energy business and that the EPA lacks jurisdiction, particularly once the NRC promulgates conforming regulations. Commenters question the need to retain Subpart W at all, with one commenter contending that the existence of the Atomic Energy Act (AEA) makes Subpart W redundant and not necessary.

One commenter takes the position that the EPA does not have authority to define when uranium recovery facilities are considered to be "active" or involved in "operations." Instead, the commenter states that the NRC, not the EPA, has authority over decommissioning and decontamination of AEA-licensed source material recovery facilities, including the mill itself, site soil cleanup, final tailings stabilization, and groundwater restoration or corrective action. Further, the commenter states it is inefficient for uranium recovery operations to obtain two separate authorizations with essentially the same requirements for radon risk from fluid retention impoundments (*i.e.,* the NRC operating license or license amendment and the EPA Subpart W construction approval), and that these duplicative requirements are inconsistent with the EPA's past efforts towards regulatory efficiency evidenced by the rescissions of 40 CFR part 61, subparts I and T.

Another commenter states the Department of Energy also has authority to regulate this industry.

Alternatively, some commenters supported the EPA's authority under the CAA to regulate HAPs, particularly radon, from uranium processing and do not believe that the CAA limits the EPA's regulatory authority with respect to 11e.(2) byproduct material [11] at uranium recovery mill operations. Similarly, a commenter supported the proposed clarification to 40 CFR 61.252(b) (§ 61.252(a)(2) in the final rule) that the EPA, and not the NRC, is the regulatory agency administering the radon NESHAP requirements.

Response: The EPA disagrees that it lacks authority to regulate, under CAA section 112, the radionuclide air

[11] UMTRCA amended the AEA definition of "byproduct material" by adding a second category. Section 11e.(2) byproduct material is "the tailings or wastes produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material content."

emissions of sources also regulated pursuant to the AEA by the NRC. The CAA lists radionuclides as a HAP under CAA section 112(b)(1), and section 112(q) explicitly retains standards such as Subpart W that were in effect before the date of enactment of the CAA Amendments of 1990. In addition, UMTRCA resolves this issue by quite explicitly stating that ''[n]othing in this chapter applicable to byproduct material . . . shall affect the authority of the [EPA] under the Clean Air Act of 1970, as amended . . .'' (42 U.S.C. 2022(e)). The legislative history is similar: ''Authorities of the EPA under other laws would not be abridged by the new requirements'' (H. Rep. No. 1480, 95th Cong., 2d Sess. 6, p. 21). There is no indication that Congress intended UMTRCA to preempt the EPA's regulatory authority under the CAA; rather Congress expressly contemplated the EPA authority to simultaneously regulate under both legislative schemes (54 FR 51690–51691). Similarly, the EPA's regulation of the uranium processing industry works in concert with the AEA and the NRC's regulations.

Comment: Some commenters stated that the NRC, not the EPA, has exclusive authority over the definition of 11e.(2) byproduct material, as well as the material itself. Commenters question the EPA's authority to promulgate a new definition for ''11e.(2) byproduct material'' or to equate the definition to the term ''mill tailings.'' The commenters opine that the EPA may not infringe on NRC authority by proposing an alternative definition of 11e.(2) byproduct material.

One commenter also thinks that the EPA does not have statutory authority to define tailings as restoration fluid because that authority rests exclusively with the NRC.

Response: The EPA disagrees with these comments. The EPA has authority to regulate radon emissions and this authority is not limited by the AEA or the NRC. Radionuclides, including radon, are listed HAPs in CAA section 112(b). The EPA regulated radon emissions from uranium byproduct material or tailings impoundments before the list of HAPs in CAA section 112(b) was added as part of the CAA Amendments of 1990 and CAA section 112(q) explicitly retains standards that were in effect before the 1990 CAA Amendments were enacted. The EPA's regulation of the uranium processing industry works in concert with the NRC's regulation. The EPA has authority to promulgate definitions under the CAA as it deems appropriate and is not limited to the AEA's definition of ''byproduct material'' or ''tailings,'' or the NRC's definition in 10 CFR 40.4. The EPA first defined ''uranium byproduct material or tailings'' when promulgating Subpart W in 1986 (51 FR 34066, September 24, 1986). The EPA's definition identifies the scope of material covered by the Subpart W regulations and does not preempt the NRC's AEA authority. The definition in Subpart W of uranium byproduct material or tailings is not substantially or meaningfully different from the NRC's definition of byproduct material in 10 CFR 40.4 or the definition of 11e.(2) byproduct material and should not result in conflict. See also Section IV.F.2.

Regarding the question of restoration fluids, we note that the designation of restoration fluids as ''waste produced by the extraction or concentration of uranium from any ore processed primarily for its source material content'' is consistent with the approach taken by the NRC. See Staff Requirements Memorandum—SECY–99–013, ''Recommendation on Ways to Improve the Efficiency of NRC Regulation at *In Situ* Leach Uranium Recovery Facilities,'' July 26, 2000.

Comment: One commenter opposed comments of the regulated industry which argued that the EPA does not have authority to directly regulate radon emissions from uranium processing facilities. The commenter argued that the industry's arguments amount to an argument the EPA lacks authority over emissions from uranium mill tailings impoundments. The commenter opined that if industry wishes to remove a tailings facility from NESHAP regulation, it should submit a petition showing that radon emissions are not hazardous, but believes that such an effort would fail. The commenter continued that the EPA's proposed rule continues to recognize the health hazards of uncontrolled radon emissions from uranium mill tailings and the rulemaking record confirms that CAA NESHAP regulation is a necessary part of the EPA's role in regulating uranium mill tailings pursuant to its CAA and UMTRCA authorities.

Numerous commenters supported the EPA's decision to regulate radon emissions from uranium mill facilities. Specifically, two commenters state that the EPA has authority to regulate all radon at mills and another commenter confirmed that the EPA has a role in regulating uranium mill tailings. A third commenter stated that the EPA has authority to conduct radon flux measurements.

Response: The EPA acknowledges and appreciates these comments. The EPA agrees that it has authority under the CAA to regulate radionuclide emissions from uranium byproduct material or tailings as radionuclides, including radon, are listed HAPs in CAA section 112(b)(1). Data confirm conclusively that radon-222 emissions, ambient concentrations, bioaccumulation or deposition of radon and its decay products cause adverse effects on public health and the environment.

B. Retaining the Radon Flux Requirement for Impoundments in Existence on December 15, 1989

1. How did we address the radon flux requirement in the proposed and final rules?

After reviewing stakeholder comments and verifying the information provided in them, we are not eliminating the radon flux standard of 20 pCi/m^2-sec for all impoundments in existence prior to or on December 15, 1989. In the proposed rule, we provided information to show that the impoundments in existence prior to December 15, 1989 met the management practice requirements of impoundments constructed after that date (79 FR 25394). Since the conventional impoundments in existence prior to or on December 15, 1989 appeared to meet those management practice standards, we proposed that all conventional impoundments would be subject to the same management practices, regardless of the date of construction. We also proposed that all conventional impoundments (including those in existence prior to or on December 15, 1989) must meet the requirements of one of the two management practice standards, and that the flux standard of 20 pCi/m^2-sec would no longer be required for any impoundments.

During the comment period we received information that led us to conclude that we had erred in stating an equivalency between the two types of impoundments. We originally stated that the Sweetwater and Shootaring impoundments had a double liner system equivalent to the impoundments designed after December 15, 1989. We were incorrect. Commenters [12] showed that the liner systems at these two facilities were not double liners. Additionally, we were originally informed that Cell 3 at the White Mesa facility would be closed by 2014. In fact,

[12] EPA–HQ–OAR–2008–0218–0151, –0153, –0155, –0162. To be clear, our error was in believing that these impoundments were constructed in a manner that allowed them to meet the more stringent standards that were put in place after they were constructed. The standards applicable to these impoundments at the time of the 1989 rulemaking did not require double liners.

it has not.[13] After reviewing the information obtained during the public comment period, we concluded that these impoundments do not meet the management practice standards we proposed for impoundments constructed after 1989. Our analysis also showed that the impoundments in existence on December 15, 1989 can monitor radon emissions to determine compliance with the existing 20 pCi/m^2-sec standard. It is a generally available management practice standard that successfully limits radon emissions from these area sources, as provided for in CAA section 112(d)(5). Therefore, we decided to retain the radon flux standard (20 pCi/m^2-sec) and monitoring requirement for conventional impoundments in existence on or before December 15, 1989 as the applicable GACT-based management practice. Because the 1989 rule required these impoundments to comply with the requirements at 40 CFR 192.32(a)(1), we concluded that such a management practice is generally available and contributes to the control of radon emissions as described more fully in Section IV.A.2.

Some commenters also supported requiring compliance with the flux standard for all impoundments, including those not now subject to it, but we have concluded that to be unnecessary if the owner/operator of an impoundment follows the design and other management practices outlined in the GACT-based standard because these measures are expected to effectively control total radon emissions.

2. What did our updated risk assessment tell us?

As described in the preamble to the proposed rule, we updated the risk analysis we performed when we promulgated Subpart W in 1989 (79 FR 25395, May 2, 2014). We performed a comparison between the 1989 risk assessment and current risk assessment approaches, focusing on the adequacy and the appropriateness of the original assessments.[14]

Because we proposed to establish GACT-based standards to limit radon emissions from the management of uranium byproduct material or tailings at uranium recovery facilities, thereby eliminating any emissions standards and monitoring requirements, it was not necessary for us to update the risk assessment. GACT is not determined on the basis of risk. We conducted the analysis to inform ourselves regarding the continued protectiveness of the radon flux standard as we considered whether the proposed GACT approach could be extended to impoundments in existence on December 15, 1989. We concluded that, even using updated risk analysis procedures (*i.e.,* using procedures updated from those used in the 1980s), the existing radon flux standard appears to be protective of the public health and the environment.

The updated risk assessment involved evaluating exposures to off-site (maximally exposed) individuals and populations from reported total site radon emissions at a number of uranium recovery facilities. In doing so, we found that the risks to individuals and populations were comparable to or lower than those estimated in the 1989 rulemaking. The updated risk assessment employed the most recent risk factors for radon inhalation, which are age-averaged to incorporate the sensitivity of children to radiation. The factors used in the 1989 risk assessment were based on exposures to adults.

This final rule retains the flux standard for conventional impoundments in existence on December 15, 1989. The updated risk assessment and our conclusion that the radon flux standard continues to be protective support our decision to retain the flux standard in the rule. The updated risk assessment is included in the Background Information Document (BID) for the final rule.

In developing the risk assessment and BID, we also conducted environmental justice analyses for the immediate areas (*i.e.,* counties) surrounding the existing and proposed uranium recovery facilities. For all of the sites considered together, the data did not reveal a disproportionately high incidence of minority populations being located near uranium recovery facilities. However, certain individual sites may be located in areas with high minority populations. Those sites would need to be evaluated during their individual licensing processes. The data also did not reveal disproportionately high incidence of low-income populations being located near uranium recovery facilities. We also considered environmental justice analyses that were performed during the EPA's review of construction applications under 40 CFR 61.08. These analyses were conducted by EPA Region 8 in connection with the Piñon Ridge Uranium Mill in Colorado and the Lost Creek ISL uranium project in Wyoming.

3. What key comments did we receive on the radon flux requirement?

We received comments stating that the monitoring requirements for impoundments in existence on December 15, 1989 should be retained and that our proposal was based on faulty information. We also received comments recommending that monitoring be extended to all impoundments. Some commenters supported lowering the flux standard.

Comment: Many commenters opposed the proposed elimination of the monitoring requirement for conventional impoundments in existence on December 15, 1989. Commenters expressed a general concern that no data would be available, but several also specifically questioned our rationale for doing so. They provided information indicating that the three ''existing'' (*i.e.,* pre-1989) impoundments would not be able to meet the work practice standards (now designated as GACT). By contrast, a few commenters supported eliminating the monitoring requirement based on the effectiveness of the management practices.

Response: We are retaining both the radon flux standard and the monitoring requirement for conventional impoundments in existence on December 15, 1989. Commenters provided information demonstrating that the conventional impoundments previously required to monitor radon emissions (*i.e.,* Cell 3 at the White Mesa Mill and the impoundments at Shootaring Canyon and Sweetwater) are unable to meet the GACT-based standards. Although we agree with the other commenters that the GACT-based standards are effective in limiting radon emissions, they were predicated on the impoundments meeting certain minimum requirements. Because comments included information demonstrating some conventional impoundments in existence on December 15, 1989 do not meet these minimum requirements or did not enter closure as the EPA expected, it is necessary and appropriate to retain the radon flux standard and monitoring requirement for these units.

Comment: A number of commenters expressed the view that monitoring should not be limited to conventional impoundments constructed before December 15, 1989. They asserted that they have little confidence that the management practices in place for newer impoundments are effectively being implemented, and argue that it is not possible to verify their effectiveness without monitoring. The commenters

[13] EPA–HQ–OAR–2008–0218–0151, –0170.

[14] ''Risk Assessment Revision for 40 CFR part 61 Subpart W: Task 4—Detailed Risk Estimates,'' prepared by S. Cohen & Associates, November 2011, Docket No. EPA–HQ–OAR–2008–0218–0078.

also expressed concern that impoundments that are drying out (''dewatering'') are emitting larger amounts of radon, and that without monitoring the operators are not compelled to provide additional soil cover.

Response: The EPA reviewed the management practices prescribed for conventional impoundments constructed after December 15, 1989 and reaffirmed its determination that they effectively reduce radon emissions. The radon flux standard and monitoring requirement were instituted in the 1989 rulemaking to provide a means to control radon emissions from impoundments that were constructed and operated according to earlier industry practices. The EPA found that the management practices would represent a demonstrable improvement compared to those industry practices. The Agency has concluded that the appropriate action to satisfy its CAA review is to establish these management practices as GACT-based standards. We agree that operators need to take appropriate action to control radon during the period when the impoundment is operating, and not allow excessive drying during standby or other periods of limited activity. The management practices are intended to limit radon emissions. For conventional impoundments and heap leach piles, the management practices limit the exposed area and/or number of impoundments at a uranium recovery facility, which effectively limits the opportunity for radon emissions. For non-conventional impoundments, ensuring that the material is saturated will limit radon emissions by approximately 95% compared to dry materials.

Comment: Some commenters favored retaining the emissions standard for conventional impoundments constructed before December 15, 1989, but at a more stringent level. One commenter stated that a standard below 10 pCi/m^2-sec would be appropriate, and also that a review of current control technologies would support a standard of 1 to 5 pCi/m^2-sec. Another commenter noted that the 1989 Background Information Document found that a 6 pCi/m^2-sec standard was achievable and cost effective. This general view was supported by other commenters, with one stating that the 20 pCi/m^2-sec standard was established ''for economic reasons.'' One commenter also expressed concern that the EPA did not evaluate monitoring methods other than Method 115, and specifically referred to the Landauer RadTrak.

Response: Because the proposal involved eliminating all monitoring, the EPA did not evaluate the impacts of implementing other standards or monitoring methods. However, we did reaffirm that the 20 pCi/m^2-sec standard remains protective, and we also find that Method 115 remains an appropriate method to measure radon emissions from conventional impoundments.[15] We disagree with the characterization of the 20 pCi/m^2-sec flux standard as based on economics. As stated in the preamble to the 1989 final rule, when determining an ample margin of safety for the rule, ''As explained above, the risks from current emissions are very low. A NESHAP requiring that emissions from operating mill tailings piles limit their emissions to no more than 20 pCi/m^2-sec represents current emissions. EPA has determined that the risks are low enough that it is unnecessary to reduce the already low risks from the tailings piles further'' (54 FR 51680, December 15, 1989). The update of the 1989 risk assessment conducted for this rulemaking confirms that the risk to public health from uranium byproduct material or tailings managed at operating uranium recovery facilities is comparable to, if not lower than, the level of risk considered presumptively acceptable in the 1989 rulemaking. See Section IV.B.2.

C. GACT for Conventional Impoundments Constructed After December 15, 1989

1. How did we address conventional impoundments constructed after December 15, 1989 in the proposed and final rules?

We proposed to designate the management practices promulgated in the 1989 rulemaking for impoundments constructed after December 15, 1989 as GACT-based standards for all conventional impoundments. In doing so, we evaluated the reasoning used in the 1986 and 1989 Subpart W rulemakings to determine that the phased disposal and continuous disposal management practices protect public health with an ample margin of safety (54 FR 51681).

We initially defined these two management practices because they provided a means for newly-designed impoundments to limit radon emissions, either by limiting the overall size of the impoundment or by limiting the area of dried (dewatered) uranium byproduct material or tailings that can be exposed at any time. We found the two management practices to improve performance (risk to exposed individuals and population) by approximately 35% to more than 50%, respectively, compared to earlier practices of constructing larger impoundments without limiting their number or the exposed area. The potential for larger impoundments or many smaller impoundments to remain uncovered and their radon emissions uncontrolled if bankruptcy prevented proper closure was considered to provide a further advantage to the two management practices (54 FR 51680).

Owners and operators of uranium recovery facilities in the United States have all used the phased disposal method for management of uranium byproduct material or tailings in conventional impoundments, making it a generally available management practice to control radon emissions. We have found no reason to believe that this method is unworkable, unreasonably burdensome or ineffective in limiting radon emissions. Keeping the uranium byproduct material or tailings wet or partially covered, as is typical practice, further reduces radon emissions. These industry practices also clearly demonstrate that the phased disposal method is a generally available technology. In addition, while there has been no use of the continuous disposal method in the United States, it has been successfully employed in other countries, and was proposed for use by some U.S. companies in the 1980s. Therefore, this final rule designates the phased disposal and continuous disposal methods as elements of GACT-based standards for conventional impoundments constructed after December 15, 1989. Because these impoundments are separately required to comply with the requirements at 40 CFR 192.32(a)(1), we concluded that such a management practice is generally available and contributes to the control of radon emissions as described more fully in Section IV.A.2. Conventional impoundments must also comply with the construction requirements in 40 CFR 192.32(a)(1).

2. What key comments did we receive on conventional impoundments constructed after December 15, 1989?

We received some comments questioning the effectiveness of the 1989 management practices and our decision to adopt those practices as GACT-based standards. These commenters argued that there is no basis for concluding that these practices are effective in limiting radon emissions when no confirmatory monitoring has been done. They further

[15] ''Report on the Review of Method 115 to Monitor Radon Emissions From Uranium Tailings,'' prepared by S. Cohen & Associates, September 2008, Docket No. EPA–HQ–OAR–2008–0218–0122.

assert that the work practices were inadequate because practices that are actually effective in reducing radon emissions, such as maintaining a soil or water cover, were not elements of the 1989 work practices or the proposed GACT management practices.

Comment: Several commenters believe our GACT standards are unsupported because there is no monitoring data to demonstrate the effectiveness of the measures for post-1989 impoundments. Commenters criticize the analysis of control technologies in the BID prepared to support the proposal as flawed and insufficient. One commenter states that limiting the size of the impoundment is not in itself an effective means to limit radon emissions without monitoring, reporting, and the requirement of liquid or soil application. This and another commenter also believe that any new impoundments should be required to use the continuous disposal method, as the commenters view the phased disposal method as ineffective in controlling radon emissions, particularly when using water cover. The first commenter further disputes the reliance on 40 CFR 192.32(a)(1) as an effective control technology to limit radon emissions. Another commenter also suggests that the most effective control technology is an emissions limit coupled with monitoring, and believes the rule should be re-crafted along those lines.

Commenters also asserted that we have not sufficiently examined other technologies employed either in other countries or in related industries. One commenter argues that other technologies (*e.g.,* dry-stack placement, paste tailings, solidification) may be superior to open-air storage and cover in conventional impoundments, but were not evaluated in the BID.

Response: Our review under CAA section 112(q)(1) focused on the management practices applicable to post-1989 conventional impoundments (*i.e.,* continuous or phased disposal). However, as noted in the proposal, we also considered control technologies employed at other facilities in the same industrial sector and internationally. We found that the continuous and phased disposal methods adequately control radon emissions and meet the requirements for GACT—these management practices are generally available and effectively prevent adverse health impacts from radon emissions. We recognize the commenter's position that the design and engineering requirement in 40 CFR 192.32(a)(1) does not directly limit radon emissions. However, the design requirement serves two purposes. Retaining moisture or maintaining liquid levels within the impoundment does effectively inhibit radon flux while at the same time preventing releases to ground water. It is possible and important to achieve both goals.

Regarding the area limitation, we disagree with the commenters. The focus of the 1989 analysis was on limiting the surface area from which radon would be emitted.[16] Surface area is directly correlated with radon emanation—the smaller the surface, the lower the overall emissions, given similar materials. While the 1989 rulemaking clearly recognized that the use of soil cover or water are also effective in reducing radon emissions and were commonly employed by industry, the acceptability of the promulgated work practices was not predicated on those additional measures being employed, except to the extent that it was necessary to limit the exposed area when using the continuous disposal method.

Comment: Some commenters stated that the designation as an area source is not in itself sufficient to justify use of GACT. Commenters cite the legacy of contamination associated with the uranium industry as justifying the ''strongest preventive measures.'' Similarly, other commenters accuse the industry of ''cutting corners'' and believe GACT ''runs counter to everything EPA knows'' about past practices. Another commenter argues that the Agency's ''discretion'' must be supported by full and complete explanation and justification. These and other commenters also believe the EPA has not sufficiently considered MACT approaches.

Response: When setting standards, the EPA aims to ensure that the promulgated standards effectively protect against adverse environmental and health impacts, regardless of whether such standards are based on GACT or MACT. For area sources, the Administrator has the discretion under CAA section 112(d)(5) to set standards based on GACT in lieu of setting MACT standards under sections 112(d)(2) and (d)(3), which is required for major sources. See Section IV.A.2 for discussion of regulating these units as area sources. Under CAA section 112(d)(5), the Administrator may elect to promulgate standards or requirements for area sources ''which provide for the use of generally available control technologies or management practices by such sources to reduce emissions of hazardous air pollutants.'' Consistent with section 112(d)(5), we are revising Subpart W to reflect GACT-based standards. Based on the EPA's evaluation of available information, the GACT-based approach in the final rule provides the necessary protections from management of uranium byproduct material or tailings. The emission standards and management practices established in Subpart W will appropriately reduce radon emissions from uranium recovery facilities.

[16] ''Either one of these technologies will ensure that future risks will be kept under control by assuring that *only small amounts of tailings are uncovered at any time*'' (54 FR 51681 (emphasis added)).

D. GACT for Heap Leach Piles

1. How did we address heap leach piles in the proposed and final rules?

a. When are heap leach piles regulated under Subpart W?

We proposed to regulate the heap leach pile from the moment that uranium begins leaching from the ore pile. This approach was based on the view that uranium byproduct material or tailings is produced the moment the lixiviant passes through on its first pass and uranium begins to be leached from the ore (79 FR 25403). At the point of uranium movement out of the heap, what remains is uranium byproduct material or tailings as defined by 40 CFR 61.251(g). In other words, what remains in the heap is the waste produced by the extraction or concentration of uranium from ore processed primarily for its source material content. The heap leach pile manages that uranium byproduct material or tailings, even as the pile is further leached to extract uranium. The proposal placed the emphasis on the presence of uranium byproduct material or tailings in the heap leach pile.

We also requested comment on an alternative approach we described in the proposal (79 FR 25398). Under this approach, heap leach piles would not fall under Subpart W until after leaching is permanently discontinued. This approach is based on the view that, as long as the heap is being leached, the ore on the heap leach pad is being processed. While uranium byproduct material or tailings may *exist* in the heap, the heap does not become engaged in managing uranium byproduct material or tailings until leaching is permanently discontinued. This view places the emphasis on the continued extraction of uranium from the heap leach pile. Only after that extraction potential is exhausted, and only uranium byproduct material or tailings remains, would the pile fall under Subpart W.

Many commenters (primarily those from industry) supported basing the final rule on this alternative view. These commenters argued that the heap leaching cycle is essentially serving the same function as the successive leaching of uranium that occurs in the leach and counter current decantation circuits of a conventional mill, where the ore pulp is successively leached in a series of leach tanks and thickeners. The material does not become uranium byproduct material or tailings (*i.e.,* waste) and fall under the requirements of Subpart W until it leaves the final thickener and is discharged to the tailings impoundment.

Although we proposed to bring the heap under the jurisdiction of Subpart W based upon the presence of uranium byproduct material or tailings within the pile, after further consideration we find the commenters' reasoning compelling and more consistent with previous application of the rule. Subpart W has historically not regulated radon emissions from the milling or extraction process, even at the intermediate points where residuals from uranium extraction make up the bulk of the material being processed, which may be the situation as processing of the heap progresses. Subpart W has regulated only the disposition of the wastes at the end of the separations process. Consistent with this precedent, the heap leach pile is like a conventional impoundment and will be subject to Subpart W once uranium extraction is complete and only uranium byproduct material or tailings remains. Until that time, the heap is considered to be either an unprocessed ore pile or a uranium recovery facility. Thus, heap leach piles are regulated by Subpart W only during the period between the end of processing (*i.e.,* after the pile's operational life) and the beginning of closure. As described in Section IV.F.1.a, and consistent with the requirements applicable to conventional and non-conventional impoundments, the final rule requires that operators provide written notification to the EPA and the NRC that the heap leach pile is being managed under an approved reclamation plan for that pile or the facility closure plan. Impoundments used to manage liquids resulting from the heap leach operation, to the extent they contain uranium byproduct material or tailings, are considered non-conventional impoundments subject to Subpart W, as defined in today's final rule.

There is a significant aspect of heap leach pile management that is important to these regulations. Several commenters from industry stated that a heap leach pile, unlike a conventional impoundment, will immediately begin closure after processing has concluded (either closure in place, or possibly removal for placement in a conventional tailings impoundment). If that is the case, there will be no period when the heap is subject to the requirements of Subpart W. Because there are no heap leach facilities operating in the United States, we have no basis for disputing these statements of industry's intent. Nevertheless, we have concerns that these good intentions may prove insufficient to ensure that closure takes place as expeditiously as the commenters believe. There is some potential that heap leach piles will complete processing but not immediately enter closure. During such a period the owner or operator is only using the pile to manage uranium byproduct material or tailings, and the heap leach pile is then subject to the requirements of Subpart W. The specification in the final rule that final closure does not begin until the operator has provided a written notification to the EPA and the NRC will minimize the potential for confusion regarding the applicability of Subpart W. A further concern might be that operators continue ''processing'' the pile indefinitely, thereby postponing the costs associated with closure. This would be a matter for the NRC or NRC Agreement States to consider.

We recognize that heap leach piles will emit radon while they are being processed. However, as explained above, Subpart W has traditionally been applied to uranium byproduct material or tailings after exiting the extraction process. Thus, Subpart W has not been applied to other sources of radon at uranium recovery facilities where wastes are present, such as material in thickeners or other processing units. The NRC, or NRC Agreement State, regulates the radionuclide emissions from all sources at a uranium recovery facility. The operator is required to report particulate radionuclide and Rn-222 concentrations at the facility boundary. Thus, radon emissions from sources not covered under Subpart W, including those from the raw ore in heap leach piles or processed yellowcake, are captured by the NRC reporting requirements. However, we emphasize that the best way to control radon emissions from heap leach piles after they have completed processing is to expeditiously close them and install a permanent radon barrier.

b. Phased Disposal

As described in the preceding section, after reviewing comments, we have decided to require that heap leach piles conform to the standards for other uranium recovery facility impoundments only during the period between processing (*i.e.,* after the pile's operational life) and closure. Heap leach piles meeting this description will conform to the GACT-based standard of phased disposal (piles that are 40 acres or less in area, and no more than two in this status at any time) and follow the construction requirements of 40 CFR 192.32(a)(1). We note that piles that will close in place would separately be required by NRC or Agreement State license to meet the construction requirements.

Since heap leach piles are in many ways similar to the design of conventional impoundments, the same combination of phased disposal management practices (limitation to no more than two heap leach piles that are no longer being processed but have not yet entered closure, each one no more than 40 acres in area) that limit radon emissions from conventional impoundments will also limit radon emissions from heap leach piles. Because this management practice is generally available for conventional impoundments, heap leach piles can control radon emissions through the same practice. We determined that phased disposal is a GACT-based management practice that will effectively limit radon emissions from these units. Use of the phased disposal management practice will limit the amount of exposed uranium byproduct material or tailings that can emit radon. Because these units will be separately required to comply with the requirements at 40 CFR 192.32(a)(1), we concluded that such a management practice is generally available and contributes to the control of radon emissions as described more fully in Section IV.A.2.

c. Regulating the Moisture Content of Heap Leach Piles

The third issue we are addressing is the proposed requirement for heap leach piles to maintain a 30% moisture content. In the proposal we recognized that owners and operators of conventional impoundments also limit the amount of radon emitted by keeping the uranium byproduct material or tailings in the impoundments covered, either with soil or liquids (79 FR 25398). At the same time, we recognized that keeping the uranium byproduct material or tailings in the heap in a saturated or near-saturated state (in order to reduce radon emissions) is not a similarly practical solution. In the definitions at 40 CFR 61.251(c) we have defined ''dewatered'' tailings as those where the water content of the tailings does not exceed 30% by weight. We proposed to require operating heaps to maintain moisture content of greater than 30% so that the uranium byproduct material or tailings in the heap is not allowed to become dewatered, which would allow more radon emissions. We specifically asked for comment on the amount of liquid that should be required in the heap, and whether the 30% figure was a realistic objective.

After considering stakeholder comments and information, we conclude that it is physically impossible to maintain a 30% moisture content within the heap leach pile and have it remain stable.[17] Calculations submitted by numerous commenters showed that maintaining a 30% moisture content across the heap leach pile would require the pile to be almost submerged. Further, such a condition would place a great amount of hydraulic head on the liner system, potentially causing failure. So, the final rule does not include the requirement to maintain 30% moisture content, even for the period between the end of processing and the beginning of closure, when the pile will be allowed to ''dry'' in preparation for placing a permanent radon barrier. We do encourage the NRC and facility operators to consider the appropriate use of soil and liquid to limit radon emissions from heap leach piles, as well as methods to reduce the potential for wind erosion (*e.g.,* by spraying or covering the pile when not actively being leached). However, we emphasize that the best way to control radon emissions from heap leach piles after they have completed processing is to expeditiously close them and install a permanent radon barrier.

2. What key comments did we receive on heap leach piles?

Comments submitted on heap leach piles focused on the proposed approach to regulation and the proposed requirement to maintain a 30% moisture content.

Comment: Most commenters on this topic disagreed with our proposal to regulate heap leach piles under Subpart W while they are being processed. These commenters expressed the view that material in the heap leach pile does not become uranium byproduct material or tailings until processing is complete, including a final rinse. As stated by one commenter, ''Heap leaching is part of the milling process, and the proposed rules would interfere with such processing operations.'' The commenter believes that, in essence, the heap leach pile is analogous to the conventional mill, which we have not previously proposed to regulate under Subpart W.

Further, several of these commenters stated that heap leach piles will immediately enter into closure upon the cessation of processing, so there is no period when they are ''operating'' simply as uranium byproduct material or tailings management units. As a result, they see no time at which Subpart W can apply to heap leach piles.

Some commenters raised the distinction between ''close in place'' piles and ''on-off'' piles. Commenters explain that the latter operations involve the removal of the processed heap and placement in a conventional impoundment. In this case, the commenters agree that the uranium byproduct material or tailings from the heap, and the impoundment into which it is placed, would be subject to Subpart W.

Response: The final rule does not include requirements related to heap leach piles undergoing processing. We acknowledge the comments that indicate that uranium byproduct material or tailings is generated once processing begins. To ensure that heap leach piles are regulated consistent with other units subject to Subpart W, we conclude that the heap leach pile is, for purposes of Subpart W, more appropriately considered part of the milling process than as an impoundment whose function is to manage uranium byproduct material or tailings. In other words, while the pile may *contain* uranium byproduct material or tailings, the pile itself *is* the ore from which uranium is being extracted, and does not become a waste until that process is completed. The rule does, however, cover the other impoundments used to manage the uranium byproduct material or tailings associated with the heap leaching operation.

We appreciate the commenter's description of the ''on-off'' heap leach piles and agree that if a processed heap is removed and placed in a conventional impoundment, that impoundment is subject to Subpart W.

We emphasize the importance of closing piles ''as expeditiously as practicable considering technological feasibility'' once processing concludes. Industry commenters provided assurances that there would be no untoward delay in beginning the closure process. We encourage NRC to ensure that this is the case. Closure is a more comprehensive system to assure that emissions are minimized for the long term. Once processing has ended, the heap leach pile serves only as a uranium byproduct material or tailings management structure. Such a pile will be subject to Subpart W if the operator has not informed regulators that it is being managed under an approved reclamation plan. As set forth in the final rule, in such a situation, the phased disposal restrictions will apply (no more than two such piles at any time, with area no greater than 40 acres each). Heap leach piles subject to Subpart W must also comply with the construction requirements at 40 CFR 192.32(a)(1). Timely closure of heap leach piles will be better for public health than maintaining piles in an interim state in which they fall under Subpart W.

Comment: Some comments supported our proposed approach, and recommended that we establish an emissions standard and monitoring requirements for heap leach piles. These commenters agree that, because uranium byproduct material or tailings is generated within the heap leach pile at the time processing begins, the pile serves to manage that material during the operation of the facility. These commenters believe this function brings it under the scope of Subpart W. These commenters also take a more expansive view, and believe the EPA is obligated under the CAA to address the entire process at heap leach facilities in the final rule. In this approach, Subpart W would apply to ore stockpiles, ore crushing and heaps that are awaiting processing, as well as to the heap until placement of the final cover. One commenter further recommends that open-air heap leaching not be approved, when leaching can be conducted more safely and with lower emissions inside a designed enclosure.

Response: As stated in the response to the previous comment, Subpart W will not regulate heap leach piles while they are being processed (*i.e.,* during the heap leach pile's operational life). We proposed to apply certain management practices to heap leach piles, but did not propose to establish a radon emission standard and monitoring requirements. Regarding the extension of Subpart W to ores and other similar materials, when the EPA initially promulgated Subpart W in 1986, we identified radon as the radionuclide released to air that presented the highest risk at uranium recovery facilities and determined that units managing uranium byproduct material or tailings were the most significant source of radon emissions (51 FR 34056). Since 1986 and re-promulgation in 1989, Subpart W has only regulated units that manage uranium byproduct material or tailings

[17] EPA–HQ–OAR–2008–0218–0144, –0162, –0169, –0170.

at uranium recovery facilities. 40 CFR 61.250. Other potential emission points in these facilities were not previously the subject of Subpart W regulation and were not assessed for the 1989 rulemaking. The EPA's CAA section 112(q) review of Subpart W was limited to the existing standard. Because Subpart W did not regulate other potential emission points, the EPA did not include any other potential emission points in its CAA section 112(q) review. In this final rule, the EPA continues to regulate the management of uranium byproduct material or tailings from conventional mills, from in situ leach facilities and from heap leach piles.

Comment: A significant number of commenters raised objections to the proposed requirement that heap leach piles be maintained at 30% moisture content as a means to limit radon emissions. Calculations submitted by numerous commenters have shown that to maintain a 30% moisture content across the heap leach pile would require the pile to be almost submerged. The commenters broadly agreed that this is an unrealistic goal that could severely undermine the stability of the pile. Further, it would result in a significantly greater hydraulic head, which raises the risk of liner failure. Several commenters also consider the monitoring requirement to be difficult to implement. As with the proposal to maintain one meter of liquid in non-conventional impoundments, concern was also expressed regarding the source of the water. Commenters suggested that a simpler water balance, which would involve calculations of the amount of liquid entering and leaving the pile, would be a more implementable method of estimating moisture content.

Response: Recognizing the difficulties associated with maintaining a 30% moisture content across the heap leach pile, the final rule does not include a requirement related to the moisture content of heap leach piles. That being said, keeping the pile wet or covered will help reduce radon emissions. We encourage operators as well as the NRC and NRC Agreement States to consider methods that can be applied during the operational life of the heap leach pile.

E. GACT for Non-Conventional Impoundments

1. How did we address non-conventional impoundments in the proposed and final rules?

The purpose of non-conventional impoundments, also known as evaporation or holding ponds, is to manage liquids generated during and after uranium processing operations. We proposed to require one meter of liquid to remain in the impoundment at all times (79 FR 25411). The liquid cover was proposed as a management practice that would limit radon emissions from the uranium byproduct material or tailings.

The Subpart W regulation as promulgated in 1989 did not clearly distinguish between conventional tailings impoundments and those operating as ponds (*i.e.,* those defined as ''non-conventional impoundments'' in this final rule). The proposed regulation intended to clarify this distinction.

For non-conventional impoundments, the proposed rule allowed for an unlimited number of units to be operating, with no size limitation, but required that a depth of one meter of liquid be kept above any precipitated solids (uranium byproduct material or tailings). The use of the word ''liquid'' is important here. Typically, operators divert process water to evaporation or holding ponds, where it may be recycled, treated, evaporated, or disposed by injection. Thus, it is likely that the liquid entering the impoundment will contain uranium byproduct material or tailings in solution or suspension. Some portion of this uranium byproduct material or tailings will settle out into sediments. In our proposal we did not specify that the one meter of liquid covering a non-conventional impoundment be fresh water; however, we did refer to ''water'' in the preamble, and the comments demonstrate that there has been some confusion about this point.

Various commenters described the cost of locating fresh water in the semi-arid and arid western portions of the United States in order to meet the one meter requirement. Other comments focused on the limitations in operational flexibility that a fresh water cover would create by changing the chemistry of a stream that is often recycled back into the extraction process, or noted that this requirement would require re-design of impoundments.

We recognize that this requirement could result in the need to use large volumes of water that may not be readily available in the arid to semi-arid areas in which most uranium recovery facilities operate. Even for facilities that maintain large volumes of process water in ponds, there would likely be some demand for fresh water as a supplement to maintain the required liquid level. Further, maintaining this level of liquid cover would result in placing significantly more hydraulic head on the liner systems for the impoundments, which is counter to existing state and federal regulations and guidelines for operating these systems, as well as a concern to the Agency that the liner would be more susceptible to failure.

In light of these comments, we took a closer look at the proposed requirement. The best indicator of potential Rn-222 emissions during the impoundment's operating period is the concentration of Ra-226 in the liquid and sediment. The BID to support the 1989 rulemaking indicates that the Ra-226 concentrations in conventional uranium byproduct material or tailings is as much as an order of magnitude higher than evaporation pond sediments at the same uranium recovery facility (1989 BID Volume 2, Risk Assessments, EPA/520/1–89–006–1, Table 9–2, Docket No. EPA–HQ–OAR–2008–0218). We have recognized that keeping uranium byproduct material or tailings in conventional impoundments wet helps to limit radon emissions. Moreover, this management practice is used throughout the industry, even in arid regions, and can thus be considered ''generally available.'' We have further recognized that the difference between uranium byproduct material or tailings that are saturated and those covered with one meter of liquid is negligible (79 FR 25398). Therefore, the final rule's requirement that solids remain saturated achieves the same goal as the proposed standard of maintaining a one-meter liquid cover.

Commenters also expressed concern over Rn-222 emissions resulting from Ra-226 dissolved in the liquid present in non-conventional impoundments, as opposed to solid materials in the bottom of the impoundment. A number of commenters questioned our conclusion that radon emissions from uranium byproduct material or tailings in non-conventional impoundments could be greatly reduced by keeping the solids saturated, and reduced to nearly zero by maintaining a liquid cover. The BID shows in Figure 12 that 100% saturated soil reduces radon emanation by nearly 95% compared to dry material, while one meter of liquid provides a further reduction of about 93%, or an overall reduction of greater than 99% (BID Equation 5.1).[18] In either case, radon emissions from non-conventional impoundments would be controlled to levels that represent limited risk to public health. However, commenters argued that actual data on the liquid contents of non-conventional impoundments (primarily from the

[18] See also ''Risk Assessment Revision for 40 CFR part 61 Subpart W: Task 5—Radon Emissions from Evaporation Ponds,'' S. Cohen & Associates, November 2010, Docket No. EPA–HQ–OAR–2008–0218–0123.

White Mesa mill), when evaluated using a correlation in the updated risk assessment, showed radon emissions well in excess of 20 pCi/m^2-sec.

We carefully evaluated the data and emissions analyses submitted by commenters. We determined that the data cited by the commenters did not support their conclusions. We conclude that our analysis in the proposal was correct regarding the characteristics of non-conventional impoundments and the radon attenuation that could be achieved. See Section IV.E.2 for more detail on this issue.

To summarize, we received comments that raise concerns regarding the economic and technical feasibility, as well as the practical effect, of specifying a liquid level for non-conventional impoundments. We further confirmed that keeping the sediments in a non-conventional impoundment at 100% saturation is nearly as effective as maintaining one meter of water (liquid) cover (Figure 12 in the BID for the final rule). The cost and logistics of maintaining a one-meter liquid cover in arid regions also favor maintaining saturation, especially given that saturation effectively controls emissions and will limit economic impacts.

We evaluated management practices in use at non-conventional impoundments in the industry that could achieve the goal of limiting radon-222 emissions from these units. These units are designed to hold liquid, and typically any uranium byproduct material or tailings contained in these impoundments is covered by liquid. Maintaining a liquid cover over the uranium byproduct material or tailings would effectively control radon and is a practice that is generally available to owners and operators of non-conventional impoundments. Therefore, we have revised the proposed rule language to indicate that the solids in a non-conventional impoundment must remain saturated at all times. In this final rule, we are establishing this condition, along with the liner requirements in 40 CFR 192.32(a)(1), as GACT-based standards for non-conventional impoundments. As noted above, this will reduce radon emissions by approximately 95% compared to dry conditions. We recognize that operators may still have to add water at times to ensure that the uranium byproduct material or tailings remain saturated, particularly during standby or high-evaporation periods. However, we anticipate that the need for additional water will be much less than would be necessary to maintain one meter of liquid. Because these impoundments are separately required to comply with the requirements at 40 CFR 192.32(a)(1), we concluded that such a management practice is generally available and contributes to the control of radon emissions as described more fully in Section IV.A.2.

The final rule requires that visual evidence of saturation must be recorded and maintained by the owner/operator of the non-conventional impoundment, which we anticipate can be obtained using a smartphone or a digital camera during the routine daily inspections required by NRC regulations. Written observations must be recorded daily, with digital photographs to be taken at least weekly. Photographs including embedded metadata must be uploaded to the Subpart W Impoundment Photographic Reporting (SWIPR) Web site maintained by the EPA on at least a monthly basis, beginning on the effective date of this final rule.[19] Until that time, and subsequently should the SWIPR site be unavailable, digital photographs must be maintained by the facility owner/operator and provided to the EPA or authorized State upon request. Should the operator determine that the liquid has fallen to a level that exposes solid materials, the operator must correct the situation within one week, or other such time as specified by the EPA or the authorized State. This provides flexibility if the operator needs to take the impoundment out of service for a longer period to address the situation, such as to repair the liner. Photographs must be taken that show conditions before and after the liquid level is adjusted to verify that appropriate corrective actions have been taken. There is no limit on the size or number of non-conventional impoundments.

2. What key comments did we receive on non-conventional impoundments?

We received a variety of comments related to non-conventional impoundments. Many were related to the proposed requirement to maintain one meter of liquid in the impoundment. Others related to the potential for radon emissions from liquids in the impoundments, and whether those risks were properly characterized.

Comment: Many commenters opposed the proposed requirement to maintain one meter of liquid in the impoundment. Commenters primarily cited cost and the logistical difficulty of obtaining and transporting water as making this proposed requirement overly burdensome, particularly in the arid West. A few commenters noted that impoundments that had already been approved and operating were not constructed with a depth that could accommodate an additional meter of water, potentially necessitating costly renovation. Other commenters noted that this requirement would have effects on the facility operation, where it is necessary to manage evaporative or holding capacity, and to control the characteristics of liquids that may be recycled through the process. The additional stress on the impoundment liner was also raised.

Some commenters questioned the need for this requirement, and noted statements in previous rulemakings that the difference between saturation and one meter of water is negligible. Commenters further argued that non-conventional impoundments present a small risk in any case. A few commenters suggested that a better approach would be to require that solid materials in the impoundment remain saturated, with no solids visible above the liquid level.

Response: We recognize the concerns raised regarding maintaining one meter of liquid in non-conventional impoundments. Because we determined that radon emissions can be controlled if the solids in non-conventional impoundment remain saturated, the final rule does not include a requirement to maintain one meter of liquid in the impoundments. Instead, the final rule adopts the approach suggested by the commenters. Solid materials in the impoundment must remain saturated, with no solids visible above the liquid level. This will achieve a reduction of roughly 95% compared to emissions from dry material. Saturation must be documented by written and visual records, with digital photographs taken on at least a weekly basis. We disagree that the non-conventional impoundments present such a small risk that they need not be regulated under Subpart W.

Comment: Commenters find difficulties in measuring compliance with the proposed one meter liquid requirement. One commenter believes direct measurements will be difficult because of the density of sediments and may present health and safety risks to workers. The commenter suggests that calculations based on mass and liquid balances would be more effective. Another commenter makes a similar suggestion, that the one meter requirement be replaced with a calculation to take into account site-specific factors and give operators

[19] SWIPR is accessed through the EPA's Central Data Exchange (CDX) (*https://cdx.epa.gov*). Information submitted to SWIPR is available to the public after review.

greater flexibility. A third commenter sees problems with the slope of the impoundment and the distance that must be observed, and notes that past experience suggests that measuring devices (such as pressure transducers) will need frequent maintenance and calibration. The commenter prefers to have a simple permanent indicator allowing visual confirmation, rather than measurement.

Response: We appreciate these comments and thoughtful suggestions. The final rule does not include a requirement to maintain one meter of liquid in the impoundments. Instead, the final rule requires that solid materials in the impoundment must remain saturated, with no solids visible above the liquid level. Although we proposed a one meter liquid cover, comments and further evaluation persuaded us that keeping solids saturated controls emissions nearly as effectively as maintaining a one-meter liquid cover. As explained in Section IV.E.1, we have recognized that keeping uranium byproduct material or tailings wet helps to limit radon emissions. We have further recognized that the difference between uranium byproduct material or tailings that are saturated and those covered with one meter of liquid is negligible. See Section IV.E.1 and 79 FR 25398.

Comment: Some commenters argue that the potential for radon emissions from non-conventional (liquid) impoundments has been greatly understated. They state that the general position taken by regulatory agencies (including the EPA) and industry that these impoundments represent a negligible source of radon compared to the solids in conventional impoundments is not supported by data. In particular, the commenters believe that radium in solution or suspension in the liquids has been overlooked as a potential source of radon, compared to solids or sediments in the bottom of the non-conventional impoundments. Commenters cited data from the 2013 and 2014 ''Annual Tailings System Wastewater Sampling Report'' submitted by Energy Fuels to the State of Utah to support this contention. Using radium data from liquid samples collected from Cells 1, 3, 4 and 4A at the White Mesa Mill and a correlation to radon flux from liquids in the EPA's risk assessment to support the rulemaking (the ''Task 5'' report, Docket No. EPA–HQ–OAR–2008–0218–0123), the commenters calculate radon fluxes well in excess of 20 pCi/m^2-sec (up to 2,317 pCi/m^2-sec from Cell 1 in 2014). The commenters further note a significant increase in the radium measurements for three of the four impoundments from 2013 to 2014, likely attributable to evaporation and concentration of the radium in solution (Cell 3 showed a significant increase from 2012 to 2013, but dropped in 2014). They conclude that the risk to public health associated with radon emissions from non-conventional impoundments is much greater than the EPA has acknowledged.

Response: The EPA disagrees that the data provided by commenters support their conclusion that the liquids have been underestimated as a source of radon. First, the laboratory analyses included in the sampling report refer to ''Total Alpha Radium'' (or ''Gross Radium Alpha'') and specify the analytical method as EPA Method 900.1.[20] This method cannot distinguish between different alpha-emitting isotopes of radium, which are all chemically identical. In addition to Ra-226, the isotope of concern that decays to form Rn-222, the sample may also contain Ra-224 (a decay product of Thorium-232) and Ra-223 (a decay product of Uranium-235). Because of the vast difference in their decay rates,[21] Ra-224 and Ra-223 need be present in much smaller amounts (by mass) to have the same activity as Ra-226. For example, one gram of Ra-226 will have the same activity as about 6.25 micrograms (6.25×10^{-6} grams) of Ra-224. It is known that the White Mesa Mill has processed materials containing Th-232, which makes it likely that Ra-224 is present in some amount. Given these sources of uncertainty, these results cannot definitively represent Ra-226 concentrations. Other sources of uncertainty could include interference from barium present in the liquid sample, as Method 900.1 relies upon precipitation with barium sulfate to separate the radium. Moreover, while Method 900.1 can essentially separate uranium from the sample, it is less effective at separating other alpha-emitting radionuclides, such as isotopes of thorium. Thus, some small amounts of uranium and thorium could solubilize and ''carryover'' into the precipitated sample, which would also affect the analysis. Given the numerous uncertainties associated with the data relied upon by the commenters, these data cannot reliably serve as a surrogate for Ra-226. Without specific isotopic analyses, which were not performed on the samples presented in the 2013 and 2014 reports, the actual Ra-226 concentrations cannot be determined.

The 2015 annual wastewater sampling report for White Mesa[22] contains additional information to clarify this situation. Samples taken on two separate occasions from each of the cells (compared to the single sampling conducted in previous years) were analyzed not only for total alpha radium, but also for the isotope Ra-226, using EPA Method 903.1 (''Prescribed Procedures for Measurement of Radioactivity in Drinking Water,'' Docket No. EPA–HQ–OAR–2008–0218). These results confirm that total alpha radium is not the correct basis for calculations of radon emissions. Table 4 below shows the 2015 results for Cell 1, compared to the 2013 and 2014 results that were cited by the commenters. Cell 1 has been in use since 1981, and has only been used to manage liquids (*i.e.,* no solids from the mill have been placed in it). It consistently shows among the highest levels of total alpha radium.

TABLE 4—MONITORING RESULTS FROM CELL 1 AT THE WHITE MESA MILL

	Total alpha radium (pCi/L)	Ra-226 (pCi/L)
2013	32,700	Not analyzed.

[20] ''Prescribed Procedures for Measurement of Radioactivity in Drinking Water,'' EPA–600/4–80–032, August 1980, Docket No. EPA–HQ–OAR–2008–0218.

[21] Radium-226 has a half-life of 1,600 years, while Radium-224 and -223 have half-lives of 3.66 days and 11.43 days, respectively. EPA Method 900.1 has been used by drinking water systems to show compliance with the regulatory standard of 5 pCi/L for combined Ra-226 and Ra-228, which is well below the activity found in effluents from uranium processing. Ra-228 is a pre-cursor of Ra-224 that decays by beta emission and has a half-life of 5.75 years. If the result is below 5 pCi/L using Method 900.1, there is no need for additional analysis. Half-life is the amount of time for one-half of the radionuclide to decay. Further, although Ra-223 and Ra-224 decay to form Rn-219 and Rn-220 (also known as ''thoron''), respectively, these isotopes of radon are also very short-lived (half-lives less than one minute each) and therefore are not considered to be of concern for exposures to the public.

[22] Environmental reports for the White Mesa Mill are available from the Utah Department of Environmental Quality at *http://www.deq.utah.gov/businesses/E/energyfuels/whitemesamill.htm.*

TABLE 4—MONITORING RESULTS FROM CELL 1 AT THE WHITE MESA MILL—Continued

	Total alpha radium (pCi/L)	Ra-226 (pCi/L)
2014	331,000	Not analyzed.
2015 Sample 1	73,800	829.
2015 Sample 2	735,000	1,110.

Source: ''2015 Annual Tailings System Wastewater Sampling Report,'' Energy Fuels.

The Ra-226 concentrations found in 2015 are consistent with historical data, also included in the sampling reports. For the period 1980–2003, the maximum concentration of Ra-226 recorded is 1,690 pCi/L, based on sampling from Cell 1, Cell 2, and Cell 3 (it is not specified which cell recorded the maximum concentration). Table 6 of the Task 5 report estimates that, based upon site-specific conditions at the White Mesa Mill, a Ra-226 concentration of 1,000 pCi/L in impoundment liquids would result in a radon flux of approximately 7 pCi/m^2-sec. Using this correlation, the average radon flux from Cell 1 in 2015 would be slightly less than 7 pCi/m^2-sec. The highest level of Ra-226 in 2015 from the other impoundments was 772 pCi/L in Cell 4A, which translates to a radon flux of about 5.4 pCi/m^2-sec. Further, based on the maximum Ra-226 concentration recorded from 1980–2003, the calculated radon flux would be roughly 11.8 pCi/m^2-sec. These results indicate that the radon flux from Ra-226 suspended or dissolved in liquids in the non-conventional impoundments at White Mesa is controlled to a level that is within the range that the EPA determined to be acceptable during the development of Subpart W, without taking additional measures.

These results are also consistent with information reported for liquid impoundments at ISL facilities (see Tables 7, 8 and 9 of the Task 5 report). They also suggest that the noteworthy fluctuations in recent years may not be directly attributable to the radium content of the liquids, but may result from the analytical method used. ''Total'' or ''gross'' analytical methods are generally considered screening tools whose results are more susceptible to other influences. Energy Fuels states that the individual isotopic analyses ''show that the increasing gross alpha results are being caused by matrix interference due to the nature of the tailings solution and are not representative of gross alpha from radium concentrations in the solution'' (Energy Fuels, 2015 annual wastewater sampling report, page 15). Similar fluctuations occurred for all the impoundments (although, as noted earlier, Cell 3 showed a significant increase in 2013, with a decrease in 2014).

As an additional source of information, the facility's 2015 ''Semi-Annual Effluent Monitoring Report'' (July through December) provides radon monitoring data from air monitoring stations posted around the impoundments. The facility resumed monitoring for radon in 2013 and the data presented in Attachment J of the report show that emissions have been within the limits calculated to correspond to a 25 mrem annual dose for continuous exposure at each monitoring station. These limits serve as As Low As Reasonably Achievable (ALARA) goals for the facility.

In most cases, results are well below that level. The highest annual result (four consecutive quarters) can be seen for Station BHV–4, which is located directly south of the impoundments but still within the White Mesa facility boundary. A person located at this point during 2015 would have incurred a dose of approximately 16 mrem [23] (average quarterly results of roughly 0.31 pCi/L, compared to a calculated limit of 0.5 pCi/L). The single highest quarterly reading is listed at Station BHV–6, which is to the southeast of the impoundments at the facility boundary. The reading for the fourth quarter of 2013 is approximately 88% of the calculated limit (0.73 compared to 0.83, translating to a quarterly dose of about 5.5 mrem at that location). However, readings for the previous two quarters were recorded as zero and readings for the next quarters were significantly lower as well. There is fluctuation in these results as well, which depends to some extent on wind direction, but overall the results indicate that radon from the impoundments is not a significant public health concern.

Both the sampling data from the non-conventional impoundment cells and the radon data from the air monitoring stations at the White Mesa Mill support the EPA's conclusion that emissions from the liquids in non-conventional impoundments represent a limited source of radon and does not support commenters' argument to the contrary.

Comment: Some commenters request clarification that Subpart W should not apply to impoundments that only contain water that has been treated to meet effluent limits. The commenters see this as having no regulatory benefit, but a potential additional cost to operators who must meet the more stringent requirements in 40 CFR 192.32(a)(1). Commenters also suggest we define a threshold level of radium or uranium content below which liquids no longer must be managed as uranium byproduct material or tailings.

Response: The purpose of Subpart W is to control radon emissions from sources containing uranium byproduct material or tailings at uranium recovery facilities. The EPA agrees that if an impoundment does not contain uranium byproduct material or tailings, it is not subject to the requirements of Subpart W. The EPA is not defining a concentration or level of radium or uranium at which treated liquids would no longer be considered uranium byproduct material or tailings. Instead, such impoundments can be identified and their status can be addressed during the construction application review under 40 CFR part 61, subpart A.

Subpart W also does not apply to impoundments constructed for the purpose of managing liquids generated by closure or remediation activities, when they are used solely for that purpose. Impoundments that do not contain uranium byproduct material or tailings resulting directly from uranium recovery operations are not considered to be non-conventional impoundments as defined in Subpart W.

However, non-conventional impoundments remain subject to the requirements of Subpart W until they enter final closure pursuant to an approved reclamation plan for that impoundment, even if at some point in their operational life they are used for the purpose of managing liquids from closure or remediation activities. EPA recognizes that non-conventional impoundments that are subject to

[23] Corresponding to an annual risk of fatal cancer of less than 1×10^{-5}. See Section 4 of the BID.

Subpart W may subsequently transition to a use that supports facility closure or site remediation (*e.g.,* when an ISL wellfield enters into the groundwater restoration phase, and is no longer recovering uranium). Some parties may argue that a non-conventional impoundment's receipt of waste associated with facility closure or site remediation appears analogous to the ability of licensees to obtain a license amendment and have a reclamation plan which provides for placement of remediation wastes in conventional impoundments during the closure process. Using this analogy, some may contend that non-conventional impoundments should not be subject to Subpart W when receiving such wastes. However, such a non-conventional impoundment could later be used to manage liquids from uranium recovery operations at the next wellfield. To ensure that non-conventional impoundments that receive uranium byproduct material and tailings are managed in accordance with Subpart W, and to promote clarity and consistency with the promulgated regulations, Subpart W applies to non-conventional impoundments during the entire operating life of an impoundment which receives, or has received, uranium byproduct material or tailings directly from active uranium recovery operations. Changing a non-conventional impoundment's Subpart W applicability based on the primary use of the impoundment at any particular time during its operational life would cause unnecessary confusion and would be inconsistent with the regulations.

Operationally, this should not represent a burden to licensees. If the impoundment is being used to manage liquids from closure or remediation activities, it should remain in compliance with the requirement to retain sufficient liquid to cover solid materials in the impoundment. Further, because there is no restriction on the number of such impoundments that may be operating at one time, the licensee will not face the same pressure to begin closure as applies to conventional impoundments using the phased disposal approach.

Comment: A commenter finds the discussion of non-conventional impoundments confusing. The commenter believes we have inconsistently and inaccurately described the purpose of these impoundments, the nature of the materials in them, and our regulatory approach. The commenter wishes us to clarify that the liquids are not held in the impoundments for the purpose of covering uranium byproduct material or tailings, but the liquid in fact contains (or is) uranium byproduct material or tailings. The commenter questions how the liquid can be used to control radon emissions, when the liquid is itself in need of control, and requests that we consider that liquids high in radium content may actually cause an increase in emissions.

Response: The purpose of non-conventional impoundments (evaporation or holding ponds) is to receive liquids generated by the uranium processing operation. Uranium byproduct material or tailings may be suspended or dissolved in these liquids. Some portion of the material will precipitate out and settle on the bottom of the impoundment. In some sense, the liquid itself is uranium byproduct material or tailings because it is a waste from the concentration or extraction process. The definition of ''non-conventional'' impoundment accurately conveys the concept that these impoundments ''contain uranium byproduct material or tailings suspended in and/or covered by liquids.'' As noted in the previous comment response, impoundments containing only treated water and impoundments constructed for the purpose of managing liquids from closure or remediation activities are not non-conventional impoundments as defined by Subpart W, because they do not contain uranium byproduct material or tailings resulting directly from active uranium recovery operations.

While radium contained in the liquid will contribute to radon emissions, those emissions will be attenuated to some degree by the liquid in which it is contained. Further, liquid on top of solid materials will effectively limit radon emissions from those solids reaching the air, even if the liquid itself contains radium. While higher concentrations of radium in the liquid will generate more radon, concentrations in non-conventional impoundments have not been seen to reach levels of concern. See the response to the earlier comment in this section.

Comment: Many commenters expressed opinions related to limiting the size of impoundments. Some commenters believe Subpart W should contain limits on the size of non-conventional impoundments. The commenters believe that larger impoundments are more likely to fail and limits must be imposed to minimize the potential for ground water contamination. One commenter also believes the number of impoundments should be limited. Another commenter does not believe we have adequately supported our conclusion that the requirements of 40 CFR 192.32(a)(1) will provide protection against extreme weather events and may be subject to greater turbulence. Regarding our reference to an impoundment of 80 acres, one commenter wishes us to clarify that no actual impoundment has been as large as 80 acres, but this size has been used only for modeling purposes. Another disputes our statement that it is reasonable to assume that such impoundments will not exceed 80 acres in area, simply because one never has.

Response: We have chosen not to limit the size of non-conventional impoundments because they are not as significant a source of radon emissions and can be readily controlled by maintaining saturation of solid materials, but also because they provide operational flexibility to uranium recovery facilities that may need to manage, on a temporary basis, large volumes of water that can then be recycled into the process. Regarding the maximum size of such impoundments, we referred to 80 acres as a ''reasonable maximum approximation'' for estimating cost, clearly noting that it is ''the largest size we have seen'' (79 FR 25401).

Comment: A commenter states that the current and proposed rules do not actually contain any measures to control releases of impoundment contents to the surface or subsurface during extreme weather events. The commenter asserts that the EPA has not provided any data to support the conclusion that the requirements of 40 CFR 264.221 will prevent dispersion of contents in severe events. The commenter expresses concern that generally available technologies do not exist that could prevent dispersion of contents or failure of the impoundment in a severe event such as a tornado or hurricane.

Response: As discussed in the proposal, we believe the design and engineering requirements for impoundments in 40 CFR 264.221, referenced in 40 CFR 192.32(a)(1), provide a sound basis for protection against reasonably foreseeable weather events. The provisions related to avoiding overtopping (essentially, spillage or dispersion) from ''normal or abnormal operations,'' ''wind and wave action,'' or ''rainfall,'' as well as the requirement to maintain integrity and prevent massive failure of the dikes, lay a foundation for addressing the commenter's concerns. To satisfy these conditions, design of impoundments at any specific site would likely take into account regional climate and the magnitude of events such as 100- or 500-year precipitation, or the likelihood of tornados or hurricanes.

F. Definitions, References and Conforming Editorial Revisions

1. How did we address definitions, reference and conforming editorial revisions in the proposed and final rules?

a. Definition of ''Operation'' and ''Final Closure''

We proposed a relatively minor change to the definition of ''operation'' (79 FR 25404). Under Subpart W as promulgated in 1989, an impoundment was in operation when new tailings were being emplaced, from the day that tailings are first placed in the impoundment until the day that final closure begins. There has been some confusion over this definition. We proposed to amend the definition of ''operation'' in the Subpart W definitions at 40 CFR 61.251 to replace the reference to ''new'' tailings with the broader term ''uranium byproduct material or tailings'' at 79 FR 25405.

We received comments from across the spectrum of stakeholders who disliked this definition. Commenters from industry said we did not take into account the period between cessation of placement of uranium byproduct material or tailings into an impoundment and physical closure with an approved closure plan. This period can sometimes last for years while the uranium byproduct material or tailings are dewatered to an extent that heavy machinery can be used to emplace the final closure radon barrier. Also, the impoundment(s) are often used for dismantling the facility, for disposal of other liners, etc. Extending the operational period and Subpart W jurisdiction during the entire closure period could result in a milling facility having two operating impoundments in the closure process and no ability to operate a third impoundment to receive uranium byproduct material or tailings from operations. Other commenters claimed that operators were taking advantage of the existing definition by claiming that an impoundment is ''in closure'' but taking no concrete action to implement a closure plan or apply a final cover.

We do not intend to extend the jurisdiction of Subpart W to include the period during which closure activities are being conducted. The proposal was intended to clarify that an impoundment remains ''operating'' until it enters closure, even if it is not receiving newly-generated uranium byproduct material or tailings from facility processing (79 FR 25405). Further, we note that the definition in Subpart W is consistent with those in 40 CFR 192.31 and 10 CFR part 40, Appendix A, which were in fact derived from Subpart W. Thus, we find this concern to be misplaced. The final rule adopts the definition of ''operation'' as it was proposed.

We did not propose to include a definition of ''closure''; however, we realize that a lack of clarity on the concept of closure, what it involves and when it begins has affected the understanding of Subpart W. In particular, the use of the term ''final closure'' in the definition of ''operation'' does not, by itself, provide sufficient clarity on the end of operation. As described earlier, we received a number of comments making suggestions or raising concerns on this point. As noted above, the definition of ''operation'' in Subpart W served as the basis for the definitions later adopted in 40 CFR part 192 and 10 CFR part 40, Appendix A. Further, both 40 CFR part 192 and 10 CFR part 40, Appendix A adopted definitions and requirements related to closure that address some aspects of the comments we received related to Subpart W. The more appropriate action is to retain the definition of ''operation'' and clarify the meaning of final closure in a separate definition. Therefore, the final rule incorporates a new definition of ''final closure'' at 40 CFR 61.251(n).

We emphasize two aspects of this new definition that we believe will help address concerns regarding the timeliness and predictability of closure activities. First, impoundments or heap leach piles will remain subject to Subpart W until the owner or operator provides written notice that the impoundment is entering final closure. Second is the reference to the reclamation plan for the impoundment or heap leach pile. We have heard some comments, specifically related to the Cotter mill, that the facility should still be subject to Subpart W because it has never had an approved reclamation or closure plan; however, the facility no longer has an operating license under which it would conduct activities subject to the requirements of Subpart W.

The reference to a reclamation plan in the definition of ''final closure'' does not affect that Subpart W only applies to operational units and does not cover units that are in closure. Rather, it makes clear our expectation, also found in 40 CFR part 192 and 10 CFR part 40, Appendix A, that the NRC or the Agreement State require and approve such a plan. It also establishes that notice to the NRC or the Agreement State and an approved reclamation plan are necessary prerequisites for determining that the impoundment in question is no longer subject to the requirements of Subpart W. The final rule is adopting the terminology employed in NRC regulations. In 10 CFR part 40, Appendix A, NRC identifies a reclamation plan as applicable to individual impoundments, while the closure plan is a more comprehensive document that addresses all aspects of facility closure and decommissioning, including any necessary site remediation. A reclamation plan prepared and approved in accordance with NRC requirements in 10 CFR part 40, Appendix A, is considered a reclamation plan for purposes of Subpart W. The reclamation plan may be incorporated into the larger facility closure plan.

A number of commenters expressed concern that the issue of delayed closure would have been addressed by 40 CFR part 61, subpart T (40 CFR 61.220–226), which required that impoundments that are no longer accepting tailings be brought into compliance (*i.e.,* covered) within two years, or in accordance with an approved compliance agreement if it is not feasible to complete closure within two years. In accordance with a 1991 Memorandum of Understanding (MOU), the EPA and the NRC amended 40 CFR part 192 and 10 CFR part 40, Appendix A, respectively, to incorporate provisions related to the timing and requirements of activities conducted during the closure period. The EPA subsequently rescinded subpart T in 1994, finding that the NRC regulatory program protected public health with an ample margin of safety to the same level as would implementation of subpart T (59 FR 36280, July 15, 1994). The commenters correctly noted that in that action the EPA retained the authority to reinstate subpart T should we determine that the NRC was not implementing it as we intended. The Agency has no plans to reinstate subpart T at this time, but takes this opportunity to emphasize that closure of impoundments should be conducted expeditiously, taking only the time that is truly necessary to dewater or otherwise prepare the uranium byproduct material or tailings before application of interim and final covers.

b. Liner Requirements in 40 CFR 192.32(a)(1)

We proposed specific provisions for conventional impoundments, non-conventional impoundments and heap leach piles to explicitly convey that any impoundment at a uranium recovery facility that contains uranium byproduct materials or tailings would be subject to the Subpart W liner requirements. The 1986 and 1989 versions of Subpart W included a reference to 40 CFR 192.32(a); 40 CFR 192.32(a) incorporates the surface impoundment design and construction requirements of hazardous waste surface impoundments regulated under the Resource Conservation and Recovery Act (RCRA), found at 40 CFR 264.221. Those requirements state that the impoundment shall be designed, constructed and installed to prevent any migration of wastes out of the impoundment to the adjacent subsurface soil or ground water or surface water at any time during the active life of the impoundment. Briefly, 40 CFR 264.221(c) requires that, for new impoundments constructed after January 29, 1992,[24] the liner system must include:

1. A top liner designed and constructed of materials (*e.g.,* a geomembrane) to prevent the migration of hazardous constituents into the liner during the active life of the unit.

2. A composite bottom liner consisting of at least two components. The upper component must be designed and constructed of materials (*e.g.,* a geomembrane) to prevent the migration of hazardous constituents into this component during the active life of the unit. The lower component must be designed and constructed of materials to minimize the migration of hazardous constituents if a breach in the upper component were to occur. The lower component must be constructed of at least three feet of compacted soil material with a hydraulic conductivity of no more than 1×10^{-7} cm/sec.

3. A leachate collection and removal system between the liners, which acts as a leak detection system. This system must be capable of detecting, collecting and removing hazardous constituents at the earliest practicable time through all areas of the top liner likely to be exposed to the waste or liquids in the impoundment.

There are other requirements for the design and operation of the impoundment, and these include construction specifications, slope requirements, sump requirements and liquid removal requirements. As part of the proposed rule, we examined these provisions to help determine whether Subpart W adequately addresses extreme weather events. We determined that the requirements in 40 CFR 264.221 satisfactorily address such events.

The proposal did not adopt a new approach. Instead, it carried forward the approach adopted in the 1989 rulemaking. That rulemaking included § 61.252(c), which broadly required all impoundments, including those in existence prior to the promulgation of 40 CFR part 192, to comply with the requirements of 40 CFR 192.32(a). The 1986 rulemaking had not applied the requirements of 40 CFR 192.32(a) to impoundments in existence when the 1986 rule was promulgated, as these impoundments were anticipated to cease accepting uranium byproduct material or tailings by the end of 1992 (51 FR 34066). The 1989 rulemaking lifted this restriction as well as the exemption from the requirements of 40 CFR 192.32(a) (54 FR 51680).

We did not propose to remove the liner requirements or request comment on whether they should be retained. We proposed to refer only to 40 CFR 192.32(a)(1) because § 192.32(a) includes provisions that extend well beyond the design and construction of impoundments, such as ground water monitoring systems and closure requirements. These aspects do not fall under the purview of Subpart W, and they are removed in this action.

This final rule incorporates the revised reference to 40 CFR 192.32(a)(1) for all impoundments that contain uranium byproduct material or tailings and establishes this requirement as an element of GACT-based standards for conventional impoundments, non-conventional impoundments, and heap leach piles. The provision in the 1989 rule that extended this requirement to conventional impoundments in existence as of December 15, 1989 is moved to § 61.252(a)(1), which addresses those impoundments.

We received a comment suggesting that we explicitly cite 40 CFR 264.221(c) as the criteria that all impoundments are required to meet. This provision was not incorporated into regulation until 1985 (50 FR 28747). Adopting the commenter's approach would require impoundments constructed before 1985 to upgrade or close, which we did not propose to require. Those older impoundments are required to comply with the provisions of 40 CFR 264.221 that are applicable to them. The commenter's approach would also eliminate consideration of § 264.221(d), which allows for an alternative design or operating practices if ''such design and operating practices, together with location characteristics'' would prevent migration of hazardous constituents and allow detection of leaks at least as effectively as the requirements of § 264.221(c). It is not appropriate to eliminate this flexibility, particularly for sites that may employ improved liner materials or have exceptional natural characteristics that lend themselves to such a demonstration.

c. Eliminating ''As Determined by the Nuclear Regulatory Commission''

As described in the preceding section, Subpart W as promulgated in 1989 required impoundments to be constructed in accordance with the requirements cited in 40 CFR 192.32(a). This provision also included the phrase ''as determined by the Nuclear Regulatory Commission.''

As described in the preceding section, 40 CFR 192.32(a) also contains provisions related to ground water protection and closure activities, which are not within the scope of Subpart W. It is appropriate that the NRC be the sole regulatory agency for implementing and enforcing these provisions. We proposed to eliminate the phrase ''as determined by the Nuclear Regulatory Commission'' from Subpart W to clarify that EPA is an approval authority for Subpart W, but specifically for the impoundment engineering and construction requirements in 40 CFR 192.32(a)(1).

We received a number of comments from industry objecting to this change on the grounds that it would create dual regulation with NRC, thus leading to inefficiencies and the potential for one agency to approve an application while the other denied it. We disagree with these commenters, as described in detail in the next section. The final rule eliminates the phrase ''as determined by the Nuclear Regulatory Commission'' from 40 CFR 61.252(a)(2)(i) and (ii).

2. What key comments did we receive on definitions, references and conforming editorial revisions?

We received a number of comments related to the issue of operation and closure, either to extend the jurisdiction of Subpart W or to limit it. Commenters also expressed views on the liner requirements and their relation to groundwater protection or older impoundments. In connection with the liner requirements, a number of commenters disagreed with the proposal to eliminate the phrase ''as determined by the Nuclear Regulatory Commission,'' suggesting that it will create dual regulation and exceeds our rulemaking authority. Although we did not propose to revise it, we also received some comment related to the definition of ''uranium byproduct material or tailings.''

[24] 57 FR 3487, January 29, 1992. These specifications also apply to lateral expansions of existing surface impoundment units or replacements of existing surface impoundment units beginning construction or reuse after July 29, 1992. At the time of the 1986 and 1989 Subpart W rulemakings, double liners and leachate collection systems were specified for new impoundments, but the requirements did not contain this level of detail. The requirement for double liners was promulgated on July 15, 1985 (50 FR 28747).

Comment: A number of commenters advocated that the scope of Subpart W be extended to include all activities undertaken to achieve final closure of the impoundment (see also the next comment in this section). As defined in Subpart W, ''operation'' ends ''the day that final closure begins'' (40 CFR 61.251(e)). Many of the commenters would like this definition extended and explicitly stated that Subpart W should apply until the final cover is installed on the impoundment (or, for non-conventional impoundments, until the impoundment is removed, if that is the closure approach).

Response: Subpart W has never addressed remediation or reclamation activities undertaken to close the impoundment or the site and EPA did not propose to expand the scope of the rule to cover such activities. Comments on whether the separate regulations that apply during closure and until the final cover is installed are sufficient or whether additional regulations are needed to cover activities during that time period are beyond the scope of this section 112(q) review of Subpart W and thus EPA has no obligation to respond. However, a goal of this rulemaking was to provide clarity regarding when the management of uranium byproduct material or tailings is no longer subject to Subpart W. The final rule specifies that Subpart W no longer applies at the beginning of closure and further defines when closure begins. For informational purposes only, EPA discusses below some of the regulations that apply during the closure period. EPA did not reopen or accept comment on any aspects of these regulations.

In 1989, in conjunction with the promulgation of Subpart W, the EPA promulgated 40 CFR part 61, subpart T (40 CFR 261.220–226) to address the closure period and final disposal for conventional tailings impoundments (54 FR 51682). Subpart T required closure of impoundments to be complete within two years after ceasing operations.

In 1991, by Memorandum of Understanding (MOU) with the NRC, the two agencies agreed to take action to clarify the timing for closure of impoundments and processing sites. As part of this agreement, the EPA amended 40 CFR part 192 (58 FR 60341, November 15, 1993) and rescinded subpart T (59 FR 36302, July 15, 1994). The NRC subsequently amended 10 CFR part 40, Appendix A, consistent with the EPA's amended 40 CFR part 192 (59 FR 28220, June 1, 1994). The MOU included the goal that all sites could be closed and in compliance with radon emission standards by 1997 or within seven years of the date on which existing operations cease and standby sites enter disposal status. The MOU did not address Subpart W because Subpart W does not apply during closure.

The MOU and subsequent regulatory actions created a more comprehensive and coordinated framework for managing uranium processing wastes. Further, a settlement agreement with stakeholders provided additional detail to the MOU that, in part, allowed the EPA to make a finding under the CAA that the NRC's regulatory program protected public health with an ample margin of safety. This supported the Agency's decision to rescind subpart T.

In their respective rulemakings, the agencies essentially adopted the Subpart W definition of ''operation'' and included provisions related to closure that would allow certain activities related to waste management during the closure process. Among these were provisions that would allow wastes to be placed in impoundments that were also either in closure or had completed closure (final cover). These authorizations would not change the status of the impoundment or site, as we explained in our rulemaking to amend 40 CFR part 192: ''Even if a portion of a site is authorized to remain accessible for disposal of byproduct materials during the closure process or after placement of a permanent radon barrier consistent with the Settlement Agreement, as described above, this will not cause a nonoperational uranium mill tailings disposal site to revert to an operational site as defined by 40 CFR 192.31(q)'' (58 FR 60348, November 15, 1993).

Similarly, the NRC addressed this point in its 1993 proposed rule to amend 10 CFR part 40, Appendix A in response to a comment from an NRC Agreement State:

> *[Agreement State] Comment.* The word ''portion'' should be deleted from paragraph (3) of Criterion 6A.
>
> *[NRC] Response.* This provision allows limited disposal during closure as an exception to the definition of *operation.* If the whole impoundment is involved in waste disposal and no reclamation activities are proceeding, the impoundment would be considered operational and continue to be under appropriate requirements for operation. Note, one site may have both an operational impoundment and a non-operational impoundment with the applicable regulations applying to each (58 FR 58659, November 3, 1993, emphasis in original).

The final rule includes the definition of ''operation'' as it was proposed, which makes it fully consistent with the definitions in 40 CFR part 192 and 10 CFR part 40, Appendix A. We are also adopting a definition of ''final closure'' that clarifies that Subpart W does not apply to impoundments that are being managed under an approved reclamation plan for that impoundment or the facility closure plan.

Comment: Several commenters stated that the current regulatory scheme allows an unacceptable period during closure activities when impoundments are not being monitored or otherwise managed to limit radon emissions. They further argue that closure is not being conducted in a manner that will lead to timely installation of a final cover or removal of an evaporation or holding pond. They cite periods of decades during which tailings are being ''dewatered'' or impoundments are used to deposit wastes from decommissioning activities, while the drying-out of impoundments allows increased radon emissions. Commenters attribute this in some part to the Agency's rescission of subpart T, which called for installation of final covers on conventional tailings impoundments within two years of the cessation of operations. One commenter notes that an impoundment undergoing closure will be required to demonstrate compliance with the 20 pCi/m^2-sec radon emissions standard only if it requests extension of the milestones in the closure plan, where it may not have been required to monitor previously under Subpart W.

Response: The EPA did not propose to extend the jurisdiction of Subpart W beyond the operational phase, nor did we request comment on regulations that are applicable to closure activities. We are under no obligation to respond to such comments. However, one purpose of this rulemaking was to clarify at what point Subpart W no longer applies to the management of uranium byproduct material or tailings. The final rule specifies that Subpart W no longer applies at the beginning of closure and further defines when closure begins. The following response is provided in the interest of further clarifying this issue.

As described in the response to the previous comment, the EPA and the NRC entered into an MOU in 1991, after industry efforts to stay the implementation of subpart T, due, in part, to the fact that the requirement to complete closure of impoundments was unrealistically stringent. As part of the MOU, the EPA rescinded subpart T and modified its UMTRCA standards at 40 CFR 192.32 to address activities conducted during closure, including allowing placement of decommissioning wastes in non-operating impoundments. The EPA and the NRC agreed that such activities can, for the most part, be conducted and a final cover installed within seven years of the end of operations. Similar timeframes should be possible for non-conventional impoundments, which are likely to be removed altogether. We note that both 40 CFR 192.32(a)(3) and 40 CFR part 40, Appendix A were modified and require that closure take place ''as expeditiously as practicable considering technological feasibility.'' They further state that such placement of wastes during closure will not be approved if it would cause delays in emplacement of the final radon barrier to meet the disposal requirements. The MOU did not address Subpart W because Subpart W does not apply during closure.

The Agency has no plans to reinstate subpart T, although EPA is not precluded from doing so (40 CFR 261.226). Nor is the final rule extending the scope of Subpart W to cover closure activities. While this does leave a period of time when conventional and non-conventional impoundments are more likely to have increased radon emissions because they are not managed as they would be during operations, such a period is necessary to facilitate final closure activities. However, ''dewatering'' tailings for decades, particularly in the arid West, is certainly not consistent with the seven-year period envisioned by both the EPA and the NRC. Most conventional tailings are emplaced using the phased disposal method. To avoid extended dewatering periods, sites may consider using the continuous disposal method, in which tailings are dewatered before emplacement and immediately covered. Regardless of the method of emplacement, we emphasize the importance of timely closure in achieving the safe end state of these sites, and encourage the NRC and NRC Agreement States to give appropriate attention to controlling radon emissions during closure activities.

Comment: Some commenters expressed concern that impoundments are not being closed in accordance with closure plans, because the plans do not exist, milestones are absent or unclear, or milestones are not being enforced. One commenter states that the EPA should not consider an impoundment in closure until such plans are incorporated into the facility license. Another commenter recommends that we amend 40 CFR part 192 to include a provision that the EPA will verify the existence of a closure plan. Several commenters offer specific comments related to the White Mesa and Cotter sites and what they perceive as a lack of closure plans.

Response: Activities related to closure or closure plans are beyond the scope of this rulemaking and the EPA is under no obligation to respond to comments on that topic. However, one purpose of this rulemaking was to clarify at what point Subpart W no longer applies to the management of uranium byproduct material or tailings. This final rule specifies that an approved reclamation plan is a prerequisite for entering closure, thereby removing a unit managing uranium byproduct material or tailings from the jurisdiction of Subpart W. The response below is provided in the interest of clarity in conveying the provisions of the final rule. The EPA does not require, review, approve or enforce reclamation or closure plans.

As noted by one commenter, closure plans with milestones are required under 40 CFR part 192 and 10 CFR part 40, Appendix A. Closure plan requirements, closure activities and revisions to part 192 are not within the scope of this Subpart W rulemaking. The EPA typically does not see closure plans when reviewing construction applications under 40 CFR part 61, subpart A. The NRC or the Agreement State is responsible for enforcement of reclamation or closure plans. The Cotter site ceased operations several years ago, no longer has an operating license and is therefore no longer subject to the requirements of Subpart W. The site is currently a Superfund site and is conducting activities under a decommissioning license from the State of Colorado.

The final rule includes a definition of ''final closure'' that specifies notification that the impoundment in question is being managed according to the requirements and milestones in the approved reclamation plan. This should provide clarity when determining whether an impoundment is in closure, and whether Subpart W still applies.

Comment: A few commenters took the opposite view of that addressed earlier in this section. These commenters wish us to clarify that the period of operations for either a conventional or non-conventional impoundment only extends to the management of uranium byproduct material or tailings produced by the concentration or extraction of ore processed primarily for its source material content (which may include the commercial management of such wastes produced at other facilities), and not to the management of wastes (byproduct material or otherwise) generated during closure or decommissioning activities.

Response: The final rule clarifies that Subpart W does not apply during closure activities, and further defines when final closure begins. As described above in this section, this is essentially the position agreed to in the 1991 MOU between the EPA and the NRC. Both 40 CFR 192.32(a)(3) and 10 CFR part 40 Appendix A, Criterion 6(A) provide for the use of impoundments while they are undergoing closure. However, impoundments that are used to manage uranium byproduct material or tailings generated during closure or remediation activities, while remaining open to manage operational wastes, would continue to fall under Subpart W until they formally enter the closure process and implement the approved reclamation plan for that impoundment. The definition of ''final closure'' adopted in the final rule makes clear that Subpart W does not apply to impoundments that are being managed under an approved reclamation plan.

In addition to the use of an impoundment for wastes generated during closure or remediation activities, NRC regulations also provide for waste from other sources to be emplaced in the impoundment during the closure process (10 CFR part 40, Appendix A, Criterion 6(A)(3)). Approval of such emplacement requires a license amendment and must not delay complete closure of the impoundment. Subpart W does not apply to such authorized emplacements while the impoundment is undergoing closure because the unit is subject to an approved reclamation plan and, therefore, no longer operating. Depending on the terms of the license amendment, authorized emplacements at impoundments may include waste from ISL sites, which are not expected to construct permanent impoundments, thereby facilitating the overall goal of limiting the number of small disposal sites. Authorization to allow emplacement of waste from other sources during the closure process must be reflected in both the facility license and the applicable reclamation plan.

Comment: One commenter disagreed with comments described earlier and pointed out that maintaining impoundments under Subpart W jurisdiction while they are undergoing closure may cause facilities to be out of compliance with the restriction on the number of conventional impoundments. The commenter posits that this situation could arise if a facility opened a new conventional impoundment for operational uranium byproduct material or tailings, while having another one in operation and one in closure (or multiple impoundments in closure). To avoid compliance issues, the commenter explained that facilities may have to defer opening new impoundments, which could lead to temporary shutdown of the facility's processing operations if there is no outlet for the wastes. The commenter specifically notes that non-conventional impoundments may continue in operation when conventional impoundments are in closure.

Response: We did not propose to extend the scope of Subpart W to apply during closure activities and thus did not open this issue as part of our review under CAA section 112(q). Also, we are neither finalizing such an extension of applicability, nor limiting the number of non-conventional impoundments that may be in operation at any one time.

Comment: Several commenters stated that definitions in or proposed for Subpart W are inconsistent with the NRC's definitions in 10 CFR part 40 (and Appendix A). For example, two commenters state that ''[t]he definition of *Operation* conflicts with existing regulations, specifically those in 10 CFR part 40 Appendix A following the rescission of 40 CFR part 61 Subpart T.'' These commenters also suggest that we look to the Appendix A definition of ''closure'' and they note that the closure period is tied to the ''end of milling operations'' in Criterion 6.

One commenter requests clarification of the term ''day that final closure begins,'' which the commenter believes has never been adequately explained. Another commenter requests clarification on the steps that must take place for closure to begin. Commenters also stated that we did not include non-conventional impoundments in the definition of operation.

Response: It is important to make the distinction between closure of an impoundment and closure of a facility. Subpart W applies to impoundments that are operating. An individual impoundment may enter and complete the closure process, thus removing it from Subpart W jurisdiction, while other impoundments and the facility continue to operate. When the facility (site) itself enters the closure process, and is no longer operating (and generating uranium byproduct material or tailings), impoundments will also be managed according to the overall site closure plan. Tying Subpart W to the ''end of milling operations'' in NRC regulations, as suggested by the two commenters, would essentially preclude the closure of individual impoundments until overall site closure begins. This is likely contrary to the commenters' intentions. We also note that the NRC definition of ''closure'' cited by these commenters clearly refers to activities undertaken to close the entire site and is not directed specifically at impoundment closure.

Additionally, commenters have misinterpreted our proposal. The Agency does not intend to apply Subpart W to impoundments that have entered the closure process. The proposed modification of the definition of ''operation,'' which we are adopting in the final rule, clarifies that impoundments that have not yet entered closure remain subject to Subpart W, even if the material they are receiving is not newly-generated uranium byproduct material or tailings (''new tailings'' in the original). This also makes the definition more consistent with those in 40 CFR part 192 and 10 CFR part 40, Appendix A. See the proposed rule at 79 FR 25405, May 2, 2014. To further clarify this situation, the final rule includes a definition of ''final closure'' specifying that closure begins upon written notification that the impoundment is being managed according to the requirements and milestones in the approved reclamation plan for that impoundment.

This definition of ''final closure'' adopts a suggestion provided by one commenter. The commenter proposed tying ''closure period'' to a written notification from the licensee that the impoundment is no longer being used for emplacement of tailings or for evaporative or holding purposes, and is also no longer on standby for such purposes. The commenter suggests that it would be useful to explicitly address both conventional and non-conventional impoundments in the definitions, as there may be situations where non-conventional impoundments continue to operate when conventional impoundments are in closure. We are also adopting this suggestion in the definition of ''final closure.''

Adding this language should eliminate some uncertainty regarding impoundment status. This uncertainty is reflected in a statement by the same commenter regarding the White Mesa Mill. In providing information about the different impoundments, the commenter notes that ''. . . Cell 3 *could be considered* to have already commenced the closure process'' (emphasis added). The written notification requirement will help eliminate such ambiguous situations. There should be no question as to whether an impoundment is undergoing closure, and similarly no ambiguity regarding the applicability of Subpart W.

Regarding the perceived conflicts with NRC regulations, we do not see such a conflict, and note that the definition of ''operation'' in existing and proposed Subpart W is substantively identical to and served as the basis for that in 10 CFR part 40, Appendix A (we note the NRC's statement in its proposal that ''the definition of operations is in conformance with the definition of 'operational' in the proposed EPA amendment to [40 CFR part 192] subpart D and in 40 CFR part 61, subpart W'' (58 FR 58659, November 3, 1993). The commenters did not suggest that the NRC's definition is in conflict with its own regulations. Further, the same definition is used in 40 CFR 192.31(p). As noted above, we are also adding a definition of ''final closure'' in the final rule. This will provide additional clarity as to what steps the operator must take to remove an impoundment from the jurisdiction of Subpart W while remaining consistent with the definitions in 10 CFR part 40 and 40 CFR part 192. The definition of final closure explicitly addresses conventional impoundments, non-conventional impoundments and heap leach piles.

The phrase ''day that final closure begins'' was included in the original promulgation of Subpart W in 1986 (51 FR 34056, September 14, 1986). ''Final closure'' is a term defined under RCRA hazardous waste regulations in 40 CFR 260.10. ''Final closure'' in that context refers to the closure of all hazardous waste management units at a site, and is distinguished from ''partial closure,'' which refers to closure of individual units. However, as the term is used in Subpart W, and as it is being adopted in the final rule, it refers to individual impoundments, not the entire site (so is more like ''partial closure'' in the RCRA context). Subpart W differs in this respect from 40 CFR part 192 and 10 CFR part 40, Appendix A, which are both also concerned with closure of the overall site. We also note that, as described earlier, the definition of ''operations'' in Subpart W served as the basis for corresponding definitions in 40 CFR part 192 and 10 CFR part 40, Appendix A, and this phrasing has also been adopted in and provides consistency with those regulations. We did not propose to change it and we are not finalizing any changes.

Comment: The State of Utah commented on the status of liners at two of the facilities regulated by the State under its Subpart W delegation. The conventional impoundment at the Shootaring Canyon Mill was constructed in 1981 and ''was not required to be constructed in accordance with'' the requirements of 40 CFR 192.32(a). However, the State will require the liner to be upgraded if the mill goes back into production. The Shootaring Canyon Mill operated for only a short period and has been in standby for nearly 35 years. The State also addresses Cell 1 at the White Mesa Mill, which is a non-conventional impoundment also constructed in 1981. The State has not considered this impoundment to be subject to Subpart W and believes that EPA must conduct a cost-benefit analysis if the liner is required to be upgraded.

Response: Comments indicate that some stakeholders have not always clearly understood the true scope of the 1989 Subpart W rulemaking. The 1989 rulemaking revised the approach taken in 1986, which required impoundments existing at that time to cease operations by December 31, 1992 unless they could receive an exemption or extension (51 FR 34066). These impoundments were not required by Subpart W to meet the requirements of 40 CFR 192.32(a). The 1989 rulemaking lifted the operating restriction on older impoundments, but also removed the exemption from the requirements of 40 CFR 192.32(a) (54 FR 51680). This provision, promulgated as 40 CFR 61.252(c), explicitly addressed the exemption for impoundments constructed prior to the promulgation of 40 CFR part 192 and established that all impoundments used to manage uranium byproduct material or tailings became subject to the liner requirements in 40 CFR 192.32(a) when the 1989 rule became effective, regardless of when they were constructed. These liner requirements have remained in place because CAA section 112(q) explicitly retains standards that were in effect before the date of enactment of the CAA Amendments of 1990, unless and until the EPA revises them.

The two impoundments identified by the State of Utah are both required to comply with the liner requirements in 40 CFR 192.32(a)(1), and by extension 40 CFR 264.221. The standby status of the Shootaring Canyon Mill makes no difference in this regard. We understand that some stakeholders did not view the 1989 rulemaking as applicable to liquid (non-conventional) impoundments. This final rule clarifies that non-conventional impoundments did fall under the 1989 rule and are also subject to the requirements in 40 CFR 192.32(a)(1). We note that Denison Mines, the previous owner of the White Mesa Mill, stated in its response to the EPA's section 114 request for information that Cell 1 meets the requirements of 40 CFR 264.221(a).

Comment: Many commenters objected to the proposal to eliminate the phrase ''as determined by the Nuclear Regulatory Commission'' from provisions related to review of the impoundment construction requirements in 40 CFR 192.32(a)(1). Commenters in general argued that eliminating the phrase ''as determined by the Nuclear Regulatory Commission'' would result in unnecessary dual regulation if both the EPA and the NRC need to review and approve construction applications, with limited if any benefit. One commenter suggests this will have significant cost implications that were not considered during the rulemaking. Another commenter questions how disagreements between the agencies will be resolved, and suggests that appeals will be ''inappropriately complicated''.

A number of these commenters asserted that our proposal was contrary to the legal framework established by Congress for management of byproduct material as defined in Section 11e.(2) of the AEA. Commenters cite to the framework in Section 275 of the AEA, which directs the EPA to establish standards for management of byproduct material and which gives the NRC sole authority over implementation and enforcement of the EPA's standards through its licensing process (one commenter cites Title 42 of the United States Code, Section 2022(d) rather than Section 275 of the AEA). Several commenters refer specifically to that section's statement that ''no permit issued by the Administrator is required . . . for the processing, possession, transfer, or disposal of byproduct material, as defined in section 11e.(2) to this subsection.'' Another commenter suggests that the EPA is attempting to expand its role by improperly assuming or duplicating the NRC's responsibilities.

One commenter does not make these specific statutory references, but more generally criticizes the EPA for ''grossly inefficient, dual regulation'' that is ''inconsistent with efficient regulatory practices'' and goes against previous efforts by the two agencies to avoid such situations, as illustrated by the EPA's rescission of 40 CFR part 61, subparts I and T. The commenter suggests that Subpart W could also be rescinded, and notes that the EPA's separate rulemaking related to 40 CFR part 192 may be used to incorporate elements of Subpart W as needed.

We also received some comments in support of the proposal to remove the phrase ''as determined by the Nuclear Regulatory Commission.'' One commenter believes this is a welcome clarification that the EPA is administering the NESHAP program. Another commenter notes that it is not unusual for an industry to be regulated under more than one statute or agency. A third commenter points out that this situation has existed for several decades. A fourth commenter agrees and cites the EPA approvals under 40 CFR part 61, subpart A, as well as the division of responsibilities at the state level in Utah as they relate to the White Mesa Mill.

Response: The EPA disagrees that the change will be burdensome to licensees or create additional barriers to regulatory approval. We proposed this change to be consistent with the proposal to narrow the reference to the impoundment engineering and construction requirements. As explained in the preamble to the proposed rule, the requirements at 40 CFR 61.252(b) and (c) required compliance with 40 CFR 192.32(a) (79 FR 25406). However, we focus the Subpart W requirements on the impoundment design and construction requirements found specifically at 40 CFR 192.32(a)(1). The remainder of 40 CFR 192.32(a) goes beyond this limited scope by including requirements for ground-water detection monitoring systems and closure of operating impoundments. These other requirements, along with all of the part 192 standards, are implemented and enforced by the NRC through its licensing requirements for uranium recovery facilities at 10 CFR part 40, Appendix A. It is appropriate for compliance with those provisions to be solely determined by the NRC. However, when referenced in Subpart W, the requirements in 40 CFR 192.32(a)(1) would also be implemented and enforced by the EPA as the regulatory authority administering Subpart W under its CAA authority. Therefore, we revised 40 CFR 61.252(b) and (c) to specifically define which portions of 40 CFR 192.32(a) are applicable to Subpart W. Section 61.252(b) is re-numbered as 61.252(a)(2) and section 61.252(c) is incorporated into 61.252(a)(1) in the final rule.

The comments confirm that there is a misimpression that this reference to the NRC precluded the EPA from reviewing applications for compliance with 40 CFR 192.32(a)(1) in its pre-construction and modifications reviews under 40 CFR 61.07 and 61.08. That is an incorrect interpretation of the 1989 rule. To the contrary, in promulgating the 1989 rule, we stated ''Mill operators will not be allowed to build any new mill tailings impoundment which does not meet this work practice standard. EPA will receive information on the construction of new impoundments through the requirements for EPA to approve of new construction under 40 CFR part 61, subpart A'' (54 FR 51682). The referenced ''work practice standard'' includes the requirement for conformance with 40 CFR 192.32(a). We are eliminating the reference to the NRC to clarify that the EPA is an approval authority for the impoundment engineering and construction provisions in 40 CFR 192.32(a)(1). This change will have no effect on the licensing requirements of the NRC or its regulatory authority under UMTRCA to implement the part 192 standards through its licenses.

Commenters' references to AEA Section 275 as limiting our authority are incorrect. The commenters have overlooked a salient point, which is that the Subpart W rulemaking is being undertaken pursuant to our CAA authority, not under the AEA. Another relevant provision in Section 275, 275e (42 U.S.C. 2022(e)), states: ''Nothing in this Act applicable to byproduct material, as defined in section 11e.(2) of this Act, shall affect the authority of the Administrator under the Clean Air Act of 1970, as amended, or the Federal Water Pollution Control Act, as amended.'' The Federal Water Pollution Control Act is also known as the Clean Water Act.

Further, commenters who cited the prohibition on EPA permitting neglected to note the context for this provision and the specificity of the language regarding the standards of general application to be developed by the EPA. AEA section 275b.(2) reads as follows: ''Such generally applicable standards promulgated pursuant to this subsection for nonradiological hazards shall provide for the protection of human health and the environment consistent with the standards required under subtitle C of the Solid Waste Disposal Act, as amended, which are applicable to such hazards: *Provided, however,* That no permit issued by the Administrator is required under this Act or the Solid Waste Disposal Act, as amended, for the processing, possession, transfer, or disposal of byproduct material, as defined in section 11e.(2) to this subsection'' (emphasis in original). Thus, Congress required the EPA's standards to be consistent with standards applicable to nonradiological hazardous waste (subtitle C of the Solid Waste Disposal Act, better known as the Resource Conservation and Recovery Act, or RCRA) in lieu of the Agency exercising permitting authority under either the AEA or RCRA. The EPA is not contravening this restriction by exercising regulatory authority under the CAA. Responses to other comments on our legal authorities for this action may be found in Section IV.A.2.

Regarding the view of appropriate and efficient regulation, our action will not have such far-reaching consequences. The EPA and the NRC have not examined the prospect of rescinding Subpart W. As with the rescission of 40 CFR part 61, subparts I and T, and in accordance with CAA section 112(d)(9), the EPA would need to determine that the NRC's regulatory program will protect public health with an ample margin of safety. The EPA's separate rulemaking under 40 CFR part 192 specifically addresses ground water protection at ISL facilities.

Comment: Several commenters addressed the definition of ''uranium byproduct material or tailings'' in Subpart W. Commenters generally raised the distinction between ''tailings'' and ''byproduct material'' under the AEA as germane to the scope of this rulemaking. One commenter suggests that the historical focus on conventional mill tailings impoundments (or ''piles'') is linked to the CAA, and that we are impermissibly re-defining non-tailings byproduct material as ''tailings'' as a means to address them under the CAA. Another commenter noted the following in reference to the AEA definition: ''All tailings are byproduct material, but not all byproduct materials are tailings.'' A third commenter asks for clarification on how restoration fluids may be considered byproduct material. Several commenters suggested that we adopt the NRC's definition in 10 CFR 40.4 as a means to improve clarity and consistency.

Another commenter raised a question regarding wastes at uranium recovery facilities that are not derived from ores. The commenter stated that such wastes may derive from ''alternate feed'' materials that contain sufficient uranium to make processing worthwhile (*e.g.,* tailings from other mineral extraction operations), or could include wastes placed directly into conventional impoundments because they are physically or chemically similar to the material already being managed.

Response: Although we received suggestions to adopt the AEA's and the NRC's definition of byproduct material, we did not propose to revise the definition of uranium byproduct material or tailings. CAA section 112(q) explicitly retains standards such as Subpart W that were in effect before the date of enactment of the CAA Amendments of 1990, so the existing definition of uranium byproduct material or tailings remains unless or until the EPA revises it. Because we did not propose to revise the definition of uranium byproduct material or tailings, we did not open it for comment. The EPA first defined the term ''uranium byproduct material or tailings'' in 1986 and has generally used the term ''tailings'' in Subpart W for simplicity. This rulemaking clarifies the scope of the EPA's term ''uranium byproduct material or tailings'' and provides reassurance that it is not in conflict with NRC's definitions. The following discussion is provided for informational purposes to further clarify this issue.

We note that the EPA has clear authority to promulgate definitions under the CAA as it deems appropriate and is not limited to the AEA's definition of ''byproduct material'' or the NRC's definition in 10 CFR 40.4. The EPA's definition identifies the scope of material covered by the Subpart W regulations and does not preempt the NRC's AEA authority. See Section IV.A.2 for more discussion of legal authorities as they relate to this issue.

The definition of ''uranium byproduct material or tailings'' in Subpart W, as it was promulgated in 1989 and not modified by this rule, establishes that Subpart W broadly addresses radon emissions from operating structures used to manage wastes produced during and following the concentration or extraction of uranium from ore processed primarily for its source material content. The EPA acknowledges that the definition of ''uranium byproduct material or tailings,'' as originally promulgated in 1989, may not wholly conform with the common understanding of ''tailings.'' However, the scope and applicability of Subpart W is determined by the regulatory definition of ''uranium byproduct material or tailings,'' not the common understanding of tailings. Subpart W applies to the structures at uranium recovery facilities that are used to manage or contain ''uranium byproduct material or tailings'' during and following the processing of uranium ores. Common names for these structures may include, but are not limited to, impoundments, tailings impoundments, tailings piles, evaporation or holding ponds, and heap leach piles. However, the name itself is not important for determining whether Subpart W requirements apply to that structure; rather, applicability is based on what these structures contain. To clarify any potential confusion created by the Subpart W definition, any references to ''uranium byproduct material'' or ''tailings'' are now references to ''uranium byproduct material or tailings.'' These changes reaffirm the scope of Subpart W and are not substantive.

The defined scope of materials subject to Subpart W becomes more meaningful when one considers the current dominance of ISL in uranium recovery. At these sites, where conventional impoundments are not present, non-conventional impoundments managing uranium byproduct material or tailings are the most significant potential source of radon during operations. Although we do not generally expect non-conventional impoundments to be as large a source of potential emissions as conventional impoundments, non-conventional impoundments manage uranium byproduct material or tailings and emit or have the potential to emit sufficient radon that it is appropriate for the EPA to address them under Subpart W.

The designation of restoration fluids as uranium byproduct material or tailings is consistent with the approach taken by the NRC. See Staff Requirements Memorandum—SECY–99–013, ''Recommendation on Ways to Improve the Efficiency of NRC Regulation at *In Situ* Leach Uranium Recovery Facilities,'' July 26, 2000.

It is not necessary for us to explicitly address waste not resulting from the concentration or extraction of ores because Subpart W applies to impoundments, both conventional and non-conventional, that are used to manage uranium byproduct material or tailings. Such impoundments that also contain non-ore wastes continue to be subject to Subpart W. It is unlikely that an operator would construct impoundments for the sole purpose of managing wastes that do not derive from the processing of ores. As explained in Section IV.E.2, the purpose of Subpart W is to control radon emissions from sources containing uranium byproduct material or tailings at uranium recovery facilities. If an impoundment does not contain uranium byproduct material or tailings, it is not subject to the requirements of Subpart W. If construction of such impoundments is planned, they can be identified and their status can be addressed during the construction application review under subpart A.

Comment: Commenters requested clarification regarding whether liquids in impoundments *contain* byproduct material or *are* byproduct material. One commenter asked us to clarify that solids *and* liquids in impoundments are byproduct material.

Response: Subpart W applies to conventional and non-conventional impoundments to the extent they are used to manage uranium byproduct material or tailings, with the primary concern being the potential to emit radon. The uranium byproduct material or tailings may be in solution or suspension in liquids that are discharged to these impoundments, or in sediments after settling out from the liquids.

V. Summary of Environmental, Cost and Economic Impacts

As discussed earlier, uranium recovery activities are carried out at several different types of facilities. We are revising Subpart W based on how uranium recovery facilities manage uranium byproduct materials during and after the processing of uranium ore at their particular facility. As discussed in Sections III and IV, we are establishing GACT-based requirements for three types of affected sources at uranium recovery facilities: (1) Conventional impoundments; (2) non-conventional impoundments; and (3) heap leach piles.

For purposes of analyzing the impacts of the final rule, we assumed that approximately five conventional milling facilities, 50 ISL facilities (although this is only a projection since only 12 are fully licensed) and one heap leach facility, each with at least one regulated impoundment, are subject to the final Subpart W. The following sections present our estimates of the final rule's air quality, cost and economic impacts. For more information, please refer to the Economic Impact Analysis (EIA) report that is included in the public docket for this final rule (EPA–HQ–OAR–2008–0218).

A. What are the air quality impacts?

The requirements in this final rule should eliminate or reduce radon emissions at all three types of affected sources. The GACT-based standards being established by this action are based on control technologies and management practices that have been used at uranium recovery facilities for the past twenty or more years. These standards will minimize the amount of radon that is released to the air by keeping the impoundments wet or covered with soil and/or by limiting the area of exposed uranium byproduct material or tailings.

B. What are the cost and economic impacts?

Table 5 presents a summary of the unit cost (per pound of U_3O_8) for implementing each GACT-based standard at each of the three types of uranium recovery facilities. Because the requirements for liners are not attributable to Subpart W, but are required by other regulations, the only costs attributable to this rulemaking are related to maintaining liquids in non-conventional impoundments. In addition to presenting the GACT costs individually, Table 5 presents the total unit cost to implement all relevant GACT-based standards at each type of facility. For example, the table shows that conventional mills will have both conventional impoundments and non-conventional impoundments, and will also be required to maintain saturation in the non-conventional impoundments.

TABLE 5—FINAL GACT STANDARDS COSTS PER POUND OF U_3O_8

	Unit cost ($/lb U_3O_8)		
	Conventional mills	ISL facilities	Heap leach
GACT—Double Liners for Conventional Impoundments *	$1.04	....	....
GACT—Double Liners for Non-conventional Impoundments *	1.04	$3.07	$0.22
GACT—Maintaining Non-conventional Impoundment Sediments 100% Saturated	0.015	0.026	0.0013
GACT—Liners for Heap Leach Piles *	....	....	2.01
GACTs—Total for All Four	2.09	3.09	2.24
Baseline Facility Costs ** (EIA Section 6.2)	55.18	51.31	45.06
Baseline Facility Costs ***	51.56	52.49	46.08

* Liners required by 40 CFR part 192.
** Based on Price of U_3O_8 at $55/lb.
*** Based on Price of U_3O_8 at $65/lb (used in proposed rule).

A reference facility for each type of uranium recovery facility is developed and described in Section 6.2 of the EIA, including the base cost estimate to construct and operate each of the three types of reference facilities. For comparison purposes, the unit cost (per pound of U_3O_8) of the three uranium recovery reference facilities is presented at the bottom of Table 5. In developing the baseline cost, it was assumed that the price of U_3O_8 is $55 per pound. At that price, baseline facility costs increase somewhat for the conventional mill because the cost of financing (*i.e.,* interest) also increases as revenues are lower. The baseline cost for a conventional mill actually exceeds the $55/lb, which suggests that the mill cannot operate profitably. Baseline costs at $65 per pound, which was used to support the proposed rule, are also shown for comparison. This illustrates the sensitivity of facility cost to market price, which is more significant than the cost of implementing the GACT-based standards.

Based on the information in Table 5, the four GACT-based standards represent about 4%, 6%, and 5% of the baseline cost (per pound of U_3O_8) at conventional, ISL, and heap leach uranium recovery facilities, respectively. The baseline costs were estimated using recently published cost data for actual uranium recovery facilities. For the model conventional mill, we used data from the recently licensed new mill at the Piñon Ridge project in Colorado. For the model ISL facility, we used data from two proposed new facilities: (1) The Centennial Uranium project in Colorado; and (2) the Dewey-Burdock project in South Dakota. The Centennial project is expected to have a 14- to 15-year production period, which is a long duration for an ISL facility, while the Dewey-Burdock project is expected to have a shorter production period of about 9 years, which is more representative of ISL facilities. For the heap leach facility, we used data from the proposed Sheep Mountain project in Wyoming.

Baseline costs for conventional impoundment liner construction [25] will remain the same, since the final rule does not impose additional requirements. Liners meeting the requirements at 40 CFR 192.32(a)(1) are already mandated by other regulations and were mandated by the 1989 rule and, therefore, are built into the baseline cost estimate. As a result, there are no costs (or benefits) resulting from the inclusion of these requirements in the final rule.

The average cost to construct one of these impoundments is $13.8 million. We estimate that this cost is less than 2% of the total baseline costs to construct and operate a conventional mill, per pound of U_3O_8 produced.

We have estimated that for an average 80-acre non-conventional impoundment the average cost of construction of an impoundment is $24.7 million. Requiring impoundments to comply with the liner requirements in 40 CFR 192.32(a)(1) will contain the uranium byproduct material and reduce the potential for ground water contamination. The only economic impact attributable to the final rule is the cost of complying with the new requirement to maintain liquids such that solids in the non-conventional impoundments are not visible above the liquid level during operation and standby. As explained in Section IV.B.3. of this preamble, as long as solid materials are maintained in a saturated state in the non-conventional impoundments the effective radon emissions from the ponds are reduced by approximately 95%. In order to maintain a liquid surface above the sediments within a pond, it is necessary to replace the water that is evaporated from the pond. Depending on the source of water chosen, we estimate that this requirement will cost owners or operators of non-conventional impoundments between $2,909 and $37,527 per year.[26] This value also varies according to the size of the non-conventional impoundment, up to 80 acres, and the location of the impoundment. Evaporation rates vary by geographic location. The requirement to maintain a liquid surface above solid materials in the ponds is estimated to cost less than $0.03 per pound of uranium produced.

Designing and constructing heap leach piles to meet the requirements at 40 CFR 192.32(a)(1) will minimize the potential for leakage of uranium enriched lixiviant into the ground water. Specifically, this will require that a double liner, with drainage collection capabilities, be provided under heap leach piles. Baseline costs for heap leach pile liner construction will remain the same, since the final rule does not impose additional requirements. Liners meeting the requirements at 40 CFR 192.32(a)(1) are already mandated by other regulations and, therefore, built into the baseline cost estimate. Therefore there are consequently no costs (or benefits) resulting from the inclusion of these requirements in Subpart W. Baseline costs for construction will be essentially the same as for conventional impoundments. Since the liner systems are equivalent to the systems used for conventional and non-conventional impoundments, we have been able to estimate the average costs associated with the construction of heap leach pile impoundments that meet the liner requirements we are proposing, and compare them to the costs associated with the total production of uranium produced by the facility. The average cost of constructing such an impoundment is estimated to be approximately $12.6 million. The costs of constructing this type of liner system are less than 5% of the estimated total baseline costs of a heap leach facility.

In summary, we estimate that for conventional impoundments there will be no additional costs incurred through this proposed rule. For non-conventional impoundments we estimate that the additional costs incurred by this proposed rule will be to maintain a layer of liquid above solid materials in each non-conventional impoundment, and we have estimated those costs between approximately $2,909 and $37,527 per year, which represents less than $0.03 per pound of U_3O_8 produced. For heap leach piles, no additional costs will be incurred.

C. What are the non-air environmental impacts?

Water quality will be maintained by implementation of this final rule. This final rule does contain requirements (by reference) related to water discharges and spill containment. In fact, the liner requirements cross referenced at 40 CFR 192.32(a)(1) will significantly decrease the possibility of contaminated liquids leaking from impoundments into ground water (which can be a

[25] These liner systems (conventional, non-conventional and heap leach piles) are already required by 40 CFR 192.32(a)(1), which, as explained above, are requirements promulgated by the EPA under UMTRCA that are incorporated into NRC regulations and implemented and enforced by the NRC through its licensing requirements. Therefore, we are not placing any additional liner requirements on facilities or requiring them to incur any additional costs to build their conventional or non-conventional impoundments or heap leach piles above and beyond what an owner or operator of these impoundments must already incur to obtain an NRC license. Therefore, there are no projected costs (or benefits) beyond the baseline resulting from the inclusion of these requirements in Subpart W.

[26] These figures are higher than those estimated for the proposed rule. We received information during the comment period that resulted in an increase in the estimated cost of obtaining makeup water, so the final rule requirement of 100% saturation is still lower than the proposed requirement to maintain one meter of liquid, using the same base water costs.

significant source of drinking water). Section 192.32(a)(1) includes a cross-reference to the surface impoundment design and construction requirements of hazardous waste surface impoundments regulated under RCRA, found at 40 CFR 264.221. Those requirements state that the impoundment shall be designed, constructed and installed to prevent any migration of wastes out of the impoundment to the adjacent subsurface soil or ground water or surface water at any time during the active life of the impoundment. There are other requirements in 40 CFR 264.221 for the design and operation of the impoundment, and these include construction specifications, slope requirements, sump and liquid removal requirements. These liner systems for conventional and non-conventional impoundments and heap leach piles are already required by 40 CFR 192.32(a)(1), which, as explained above, are requirements promulgated by the EPA under UMTRCA that are incorporated into NRC regulations and implemented and enforced by the NRC through their licensing requirements. Therefore, we are not placing any additional liner requirements on facilities or requiring them to incur any additional costs to build their conventional or non-conventional impoundments or heap leach piles above and beyond what an owner or operator of these impoundments must already incur to obtain an NRC license.

Including a double liner in the design of all onsite impoundments that would contain uranium byproduct material or tailings will reduce the potential for groundwater contamination. Although the amount of the potential reduction is not quantifiable, it is important to take this into consideration due to the significant use of ground water as a source of drinking water.

VI. Statutory and Executive Order Reviews

Additional information about these statutes and Executive Orders can be found at *http://www2.epa.gov/laws-regulations/laws-and-executive-orders.*

A. Executive Order 12866: Regulatory Planning and Review and Executive Order 13563: Improving Regulation and Regulatory Review

This action is a significant regulatory action that was submitted to OMB for review. The Executive Order (E.O.) defines ''significant regulatory action'' as one that is likely to result in a rule that may ''raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in the Executive Order.'' Any changes made in response to OMB recommendations have been documented in the docket for this action. The EPA prepared an economic analysis of the potential costs and benefits associated with this action. This analysis, ''Technical and Regulatory Support to Develop a Rulemaking to Modify the NESHAP Subpart W Standard for Radon Emissions from Operating Mill Tailings (Background Information Document and Economic Impact Analysis),'' Docket No. EPA–HQ–OAR–2008–0218, is available in the docket and summarized in Section V of this preamble. This action is not a significant economic action.

B. Paperwork Reduction Act (PRA)

The information collection requirements in this rule have been submitted for approval to OMB under the PRA. The Information Collection Request (ICR) document prepared by the EPA has been assigned EPA ICR number 2464.02. You can find a copy of the ICR in the docket for this rule, and it is briefly summarized here. The information collection requirements are not enforceable until OMB approves them.

The information to be collected for the rule is based on the requirements of the CAA. Section 114 authorizes the Administrator of the EPA to require any person who owns or operates any emission source or who is subject to any requirements of the Act to:

—Establish and maintain records
—Make reports, install, use, and maintain monitoring equipment or method
—Sample emissions in accordance with EPA-prescribed locations, intervals and methods
—Provide information as may be requested

EPA's regional offices use the information collected to ensure that public health continues to be protected from the hazards of radionuclides by compliance with health based standards and/or GACT.

The rule requires the owner or operator of a uranium recovery facility to maintain records that confirm that the conventional impoundment(s), non-conventional impoundment(s) and heap leach pile(s) meet the requirements in § 192.32(a)(1). Included in these records are the results of liner compatibility tests and documentation that a layer of liquid above solid materials has been maintained in non-conventional impoundments. This documentation should be sufficient to allow an independent auditor (such as an EPA inspector) to verify the accuracy of the determination made concerning the facility's compliance with the standard. These records must be kept at the mill or facility for the operational life of the facility and, upon request, be made available for inspection by the Administrator, or his/her authorized representative. The rule requires the owners or operators of operating non-conventional impoundments to submit digital photographs taken during the compliance inspections required in section 61.252(b). The recordkeeping requirements require only the specific information needed to determine compliance. We have taken this step to minimize the reporting requirements for small business facilities.

The annual monitoring and recordkeeping burden to affected sources for this collection (averaged over the first three years after the effective date of the final rule) is estimated to be 6,693 hours with a total annual cost of $336,950 for the requirements related to documenting the liquid level in non-conventional impoundments, and a one-time expenditure of 460 hours and $32,890 to maintain records of impoundment design and construction. This estimate includes a total capital and start-up cost component annualized over the facility's expected useful life and a purchase of services component. We estimate that this total burden will be spread over 23 facilities that will be required to keep records.

Burden is defined at 5 CFR 1320.3(b). An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. The OMB control numbers for EPA's regulations in 40 CFR are listed in 40 CFR part 9. When OMB approves this ICR, the Agency will announce that approval in the **Federal Register** and publish a technical amendment to 40 CFR part 9 to display the OMB control number for the approved information collection activities contained in this final rule.

C. Regulatory Flexibility Act (RFA)

I certify that this action will not have a significant economic impact on a substantial number of small entities under the RFA. The small entities subject to the requirements of this action are small businesses whose company has less than 250 employees and is primarily engaged in leaching or beneficiation of uranium, radium or vanadium ores as defined by NAICS code 212291.

The EPA has determined that small entities subject to the requirements of this action are approximately 18 uranium recovery facilities that are currently operating or plan to operate in the future. The Agency has determined that the ten small businesses that own these facilities may experience an impact of less than 1% of total annual production costs, or less than $0.03 per pound of uranium produced. Details of this analysis are presented in Section 6 of the BID/EIA prepared to support this rulemaking (Docket No. EPA–HQ–OAR–2008–0218).

D. Unfunded Mandates Reform Act (UMRA)

This action does not contain an unfunded mandate of $100 million or more as described in UMRA, 2 U.S.C. 1531–1538, and does not significantly or uniquely affect small governments. The final rule imposes no enforceable duty on any state, local or tribal governments or the private sector. Thus, this rule is not subject to the requirements of sections 202 or 205 of UMRA.

This rule is also not subject to the requirements of section 203 of UMRA because it contains no regulatory requirements that might significantly or uniquely affect small governments because it contains no requirements that apply to such governments nor does it impose obligations upon them.

E. Executive Order 13132: Federalism

This action does not have federalism implications. It will not have substantial direct effects on the states, on the relationship between the national government and the states, or on the distribution of power and responsibilities among the various levels of government. None of the facilities subject to this action are owned and operated by State governments and nothing in the final rule will supersede State regulations. Thus, E.O. 13132 does not apply to this final rule.

F. Executive Order 13175: Consultation and Coordination With Indian Tribal Governments

This action does not have tribal implications, as specified in Executive Order 13175. The action imposes requirements on owners and operators of specified area sources and not tribal governments. Thus, Executive Order 13175 does not apply to this action.

The EPA notes, however, that several tribes or tribal groups expressed interest in this rulemaking due to the proximity of some of the facilities regulated under Subpart W to tribal lands. Consistent with the EPA Policy on Consultation and Coordination with Indian Tribes, the EPA consulted with tribal officials of the Ute Mountain Ute Tribe during development of this action. A summary of that consultation is provided in Docket No. EPA–HQ–OAR–2008–0218–0120.

G. Executive Order 13045: Protection of Children From Environmental Health Risks and Safety Risks

This action is not subject to Executive Order 13045 because it is not economically significant as defined in Executive Order 12866. This action's health and risk assessments are contained in Section IV.B.2 of this preamble and in the Background Information Document prepared to support this action (Docket No. EPA–HQ–OAR–2008–0218). The updated risk assessment described in Section IV.B.2 incorporated the risk coefficients from Federal Guidance Report (FGR) No. 13, ''Cancer Risk Coefficients for Environmental Exposure to Radionuclides,'' which includes age-averaged factors to convert radionuclide exposure (intake) to health risk. FGR 13 was developed subsequent to the risk assessment conducted to support the 1989 rulemaking, which relied upon factors applicable to adults. FGR 13 is undergoing revision.

H. Executive Order 13211: Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use

This action is not a ''significant energy action'' because it is not likely to have a significant adverse effect on the supply, distribution, or use of energy. This final rule will not adversely directly affect productivity, competition, or prices in the energy sector.

I. National Technology Transfer and Advancement Act (NTTAA)

This rulemaking does not involve technical standards. The rule retains requirements for radon monitoring using Method 115 that were promulgated in 1989.

J. Executive Order 12898: Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations

The EPA believes that this action does not have disproportionately high and adverse human health or environmental effects on minority populations, low-income populations and/or indigenous peoples, as specified in Executive Order 12898 (59 FR 7629, February 16, 1994). The documentation for this decision is contained in Section IV.B.2 of this preamble and the Background Information Document prepared to support this action (Docket No. EPA–HQ–OAR–2008–0218).

K. Congressional Review Act (CRA)

This action is subject to the CRA, and the EPA will submit a rule report to each House of the Congress and to the Comptroller General of the United States. This action is not a ''major rule'' as defined by 5 U.S.C. 804(2).

List of Subjects in 40 CFR Part 61

Environmental protection, Air pollution control, Hazardous substances, Radon, Tailings, Byproduct, Uranium, Reporting and recordkeeping requirements.

Dated: December 20, 2016.

Gina McCarthy,

Administrator.

For the reasons stated in the preamble, the Environmental Protection Agency amends title 40, Chapter I of the Code of Federal Regulations as follows:

PART 61—NATIONAL EMISSIONS STANDARDS FOR HAZARDOUS AIR POLLUTANTS

■ 1. The authority citation for part 61 continues to read as follows:

Authority: 42 U.S.C. 7401 *et seq.*

Subpart W—National Emission Standards for Radon Emissions From Operating Mill Tailings

■ 2. Section 61.251 is amended by revising paragraphs (b) through (f) and adding paragraphs (h) through (o) to read as follows:

§ 61.251 Definitions.

* * * * *

(b) *Continuous disposal* means a method of uranium byproduct material or tailings management and disposal in which uranium byproduct material or tailings are dewatered by mechanical methods immediately after generation. The dried uranium byproduct material or tailings are then placed in trenches or other disposal areas and immediately covered to limit emissions consistent with applicable Federal standards.

(c) *Dewatered* means to remove the water from recently produced uranium byproduct material or tailings by mechanical or evaporative methods such that the water content of the uranium byproduct material or tailings does not exceed 30 percent by weight.

(d) *Existing conventional impoundment* means any conventional uranium byproduct material or tailings impoundment which is licensed to accept additional uranium byproduct material or tailings and is in existence on December 15, 1989.

(e) *Operation.* Operation means that an impoundment is being used for the continued placement of uranium byproduct material or tailings or is in standby status for such placement. An impoundment is in operation from the day that uranium byproduct material or tailings are first placed in the impoundment until the day that final closure begins.

(f) *Phased disposal* means a method of uranium byproduct material or tailings management and disposal which uses lined impoundments which are filled and then immediately dried and covered to meet all applicable Federal standards.

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(h) *Conventional impoundment.* A conventional impoundment is a permanent structure located at any uranium recovery facility which contains mostly solid uranium byproduct material or tailings from the extraction of uranium from uranium ore. These impoundments are left in place at facility closure.

(i) *Non-conventional impoundment.* A non-conventional impoundment is used for managing liquids from uranium recovery operations and contains uranium byproduct material or tailings suspended in and/or covered by liquids. These structures are commonly known as holding ponds or evaporation ponds and can be located at any uranium recovery facility. They are typically not permanent structures unless they transition to become used as conventional impoundments. Impoundments constructed for the purpose of managing liquids from closure or remediation activities (*e.g.,* contaminated groundwater), and which are used solely for that purpose, are not subject to the requirements of this subpart.

(j) *Heap leach pile.* A heap leach pile is a pile of uranium ore placed on an engineered structure and stacked so as to allow uranium to be dissolved and removed by leaching liquids.

(k) *Standby.* Standby means the period of time that an impoundment is not accepting uranium byproduct material or tailings but has not yet entered final closure.

(l) *Uranium recovery facility.* A uranium recovery facility means a facility licensed by the NRC or an NRC Agreement State to manage uranium byproduct material or tailings during and following the processing of uranium ores. Common names for these facilities are a conventional uranium mill, an in-situ leach (or recovery) facility and a heap leach facility or pile.

(m) *Heap leach pile operational life.* The operational life of a heap leach pile means the time period from the first time that lixiviant is placed on the heap leach pile until the time the final rinse is completed.

(n) *Final closure* means the period during which an impoundment or heap leach pile is being managed in accordance with the milestones and requirements in an approved reclamation plan. Final closure for the impoundment or heap leach pile begins when the owner or operator provides written notice to the Administrator and to the Nuclear Regulatory Commission or applicable NRC Agreement State that:

(1) A conventional impoundment is no longer receiving uranium byproduct material or tailings, is no longer on standby for such receipt and is being managed under an approved reclamation plan for that impoundment or facility closure plan; or

(2) A non-conventional impoundment is no longer required for evaporation or holding purposes, is no longer on standby for such purposes and is being managed under an approved reclamation plan for that impoundment or facility closure plan; or

(3) A heap leach pile has concluded its operational life and is being managed under an approved reclamation plan for that pile or facility closure plan.

(o) *Reclamation plan* means the plan detailing activities and milestones to accomplish reclamation of impoundments or piles containing uranium byproduct material or tailings. Activities and milestones to be addressed include, but are not limited to, dewatering and contouring of conventional impoundments and heap leach piles, and removal and disposal of non-conventional impoundments. A reclamation plan prepared and approved in accordance with 10 CFR part 40, Appendix A is considered a reclamation plan in this subpart.

■ 3. Section 61.252 is revised to read as follows:

§ 61.252 Standard.

(a) Each owner or operator of a conventional impoundment shall comply with the following requirements:

(1) Radon-222 emissions to the ambient air from an existing conventional impoundment shall not exceed 20 pCi/(m^2-sec) (1.9 pCi/(ft^2-sec)) of radon-222 and all owners or operators shall comply with the provisions of 40 CFR 192.32(a)(1) in the operation of the impoundment notwithstanding the exemption for existing impoundments in 40 CFR 192.32(a)(1).

(2) After December 15, 1989, no new conventional impoundment may be built unless it is designed, constructed and operated to meet one of the two following management practices:

(i) Phased disposal in lined impoundments that are no more than 40 acres in area and comply with the requirements of 40 CFR 192.32(a)(1). The owner or operator shall have no more than two conventional impoundments, including existing conventional impoundments, in operation at any one time.

(ii) Continuous disposal such that uranium byproduct material or tailings are dewatered and immediately disposed with no more than 10 acres uncovered at any time and shall comply with the requirements of 40 CFR 192.32(a)(1).

(b) Each owner or operator of a non-conventional impoundment shall comply with the following requirements: Non-conventional impoundments shall meet the requirements of 40 CFR 192.32(a)(1). During operation and until final closure begins, the liquid level in the impoundment shall be maintained so that solid materials in the impoundment are not visible above the liquid surface, verified by daily inspections documented through notations and by digital photographic evidence collected at least weekly. Should inspection reveal that solid materials in the impoundment are visible above the liquid surface, the owner or operator must correct the situation within seven days, or other such time as specified by the Administrator.

(c) Each owner or operator of a heap leach pile shall comply with the following requirements: Heap leach piles that have completed their operating life but have not yet entered final closure shall be managed in compliance with the phased disposal management practice in paragraph (a)(2)(i) of this section. Heap leach piles shall be constructed in lined impoundments that are no more than 40 acres in area and shall comply with the requirements of 40 CFR 192.32(a)(1). The owner or operator shall have no more than two heap leach piles, including existing heap leach piles, subject to this subpart at any one time.

■ 4. Section 61.255 is revised to read as follows:

§ 61.255 Recordkeeping requirements.

(a) The owner or operator of any uranium recovery facility must maintain records that confirm that the conventional impoundment(s), non-conventional impoundment(s) and heap leach pile(s) subject to this subpart at the facility meet the requirements in 40 CFR 192.32(a)(1). These records shall include, but not be limited to, the results of liner compatibility tests.

(b) The owner or operator of any uranium recovery facility with non-conventional impoundments must maintain written records from daily inspections and other records confirming that any sediments have remained saturated in the non-conventional impoundments at the facility. Periodic digital photographic evidence, with embedded date stamp and other identifying metadata, shall be collected no less frequently than weekly to demonstrate compliance with the requirements of § 61.252(b). Should inspection reveal that a non-conventional impoundment is not in compliance with the requirements of § 61.252(b), the owner or operator shall collect photographic evidence before and after the non-compliance is corrected.

(c) The records required in paragraphs (a) and (b) in this section must be kept at the uranium recovery facility for the operational life of the facility and must be made available for inspection by the Administrator, or his authorized representative.

(1) Digital photographs taken to demonstrate compliance with the requirements of § 61.252(c) shall be submitted electronically using the Subpart W Impoundment Photographic Reporting (SWIPR) system that is accessed through EPA's Central Data Exchange (CDX) (*cdx.epa.gov*) at least monthly.

(i) Owners and operators must also submit information identifying the facility and facility location, the name or other designation of each impoundment, and the date and time of each photograph.

(ii) If the reporting form specific to this subpart is not available in SWIPR, the owner or operator must retain the digital photographs at the facility and provide them to the EPA or authorized State upon request, with the supporting information required in paragraph (c)(1)(i) of this section.

(2) [Reserved]

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