

**ADDITIONAL RULEMAKING COMMENTS RECEIVED IN RESPONSE TO
SRM-COMWDM-11-002/COMGEA-11-002**

Consistent with the Commission’s public outreach directive, as described in Staff Requirements Memorandum (SRM) COMWDM-11-0002/COMGEA-11-0002 (dated January 19, 2012), the staff sponsored public meetings seeking stakeholder comments on the Commission’s four regulatory issues, directly engaged NRC Agreement State representatives, and participated in other previously-scheduled public events and professional meetings. The types and nature of the staff’s public outreach efforts in 2012 are described in the table below.

| DATE | 2012 EVENT | COMMENT |
|-------------|---|---|
| March 2 | NRC-Sponsored Public Meeting (Phoenix, AZ) | Public meeting conducted following <i>Waste Management 2012</i> symposium |
| April 23–24 | Spring 2012 Low-Level Radioactive Waste (LLW) Forum Meeting (San Francisco, CA) | Staff presentation |
| May 8–10 | Organization of Agreement States/Conference of Radiation Control Program Directors Annual Meeting (Orlando, FL) | Staff presentation |
| May 15 | NRC-Sponsored Public Meeting (Dallas, TX) | Public Meeting |
| June 21 | Electric Power Research Institute (EPRI) International LLW Conference & Exhibit Show (Tucson, AZ) | Staff presentations |
| July 19 | NRC-Sponsored Public Meeting (Rockville, MD) | Public Meeting (including expert panels) |

In addition to expressing views on the four regulatory issues identified by the Commission in its January 2012 SRM, stakeholders provided additional comments (both written and verbal) concerning potential revisions to 10 CFR Part 61. The table below only contains comments that the staff received on the January 2012 SRM and the staff’s preliminary observations. Other public comments (including the views of the Agreement States) on the four regulatory issues identified COMWDM-11-0002/COMGEA-11-0002 have been summarized in the regulatory basis document that has been developed in support of the current site-specific analysis rulemaking; those comments do not concern the issues discussed in this Commission paper. That document is now publicly available in ADAMS (ML12306A480).

| STAKEHOLDER COMMENTS | PRELIMINARY STAFF OBSERVATIONS |
|---|--|
| <p>The waste concentration tables at Section 61.55 should be updated to reflect the latest International Commission on Radiological Protection (ICRP) dose conversion factors and dose methodologies.</p> | <p>In the decades following promulgation of the Commission's LLW disposal regulations, the § 61.55 waste classification tables have not been updated although the earlier ICRP recommendations have been superseded by more current editions. The most recent ICRP recommendations concerning radiation and tissue weighting factors are found in Publication 103 (ICRP 2007); however, ICRP Publication 103 has not been generally adopted by the NRC.</p> <p>In 2010, EPRI published an analysis describing how disposal concentration limits and individual disposal risks might hypothetically change based on more recent information available from both the ICRP and the National Council on Radiation Protection and Measurements. Using LLW performance assessment methods, the EPRI-sponsored report by James and others (2010) examines how updated ICRP dose conversion factors, in concert with current commercial LLW disposal practices, might change existing § 61.55 waste classification assignments.</p> <p>The staff has already received direction from the Commission to budget resources to update the § 61.55 waste classification tables; this effort is scheduled to begin in fiscal year 2015. Further, incorporating a site-specific Waste Acceptance Criteria option to the regulations would allow licensees to use updated dose conversion factors and dose methodologies in advance of any update to those tables.</p> |
| <p>The current regulatory basis for the duration of active institutional controls at a LLW disposal facility, currently specified as 100 years in Section 61.30, should be revisited. The NRC should consider extending it to 300 years.¹</p> <p><i>Any decision to extend the duration of active institutional controls should be supported by a cost/benefit analysis.</i></p> <p><i>Any decision to extend active institutional controls should be done so independent of any changes that might be made to the § 61.55 waste classification tables. Those tables should be maintained in the regulations.</i></p> | <p>In the workshops leading to the development of 10 CFR Part 61, a key policy issue concerned who should own the land used for the disposal of commercial LLW. Public comments generally favored governmental ownership of the disposal site at the end of operations followed by a period of institutional management (or control) providing custodial care. However, during those regional workshops, it was acknowledged that there was no 'magic number' concerning how long 'active' controls should be in place providing the requisite custodial care. It was also recognized that perpetual care of any decommissioned commercial LLW disposal site was an unrealistic expectation as such care would likely be a significant burden on future society. In recognition of the desire to minimize future administrative care burdens associated with commercial LLW disposal sites, a majority of workshop participants at one of the regional public workshops expressed a preference for a 100-year active institutional control period in conjunction with a 400-year period of passive care. In another regional workshop, some participants were only in favor of a 50-year period of active institutional controls. See NUREG-0872 (NRC 1981, p. C-35).</p> |

¹ Text in italics below contain additional, related *Stakeholder Comments* on this specific topic.

STAKEHOLDER COMMENTS**PRELIMINARY STAFF OBSERVATIONS**

For the purposes of the 10 CFR Part 61 Environmental Impact Statement (EIS), the staff examined what impact the duration of active institutional controls had on estimated doses. Time durations considered in those analyses (NRC 1981, p. 3-5) ranged from 50 to 300 years. When the 10 CFR Part 61 proposed rule was first published for public comment in 1981, the staff selected 100 years as the preferred alternative (46 FR 38091). This proposal was also based, in part, on unspecified work attributed to the U.S. Environmental Protection Agency (EPA). Several commenters on the initial proposed rule alternatively proposed that the duration of the custodial care period be raised to 300 years (47 FR 57459). In approving the final rule, the Commission noted that it found *no compelling reason* to extend the duration of active custodial care beyond 100 years suggesting that there was no benefit at the margin for a longer-duration caretaker period. In the final rule, the concentration limits for Class A LLW were pegged to the 100-year duration. Moreover, once those controls end, the staff envisions that there will be some persisting societal knowledge concerning the decommissioned LLW disposal site for a period of up to 500 years. See NRC (1989b, p. 10).

For its part, in its 1978 recommendations concerning future Federal radiation guidance, EPA suggested that active institutional controls should be relied on for no more than 100 years (43 FR 53263). EPA also suggested that if the radiation hazard extends beyond 100 years, then engineered and natural barriers should be used to essentially contain and isolate the hazards (*Op cit.*). Later, in connection with the development of draft LLW standards in 1983, EPA continued to promote the notion that a 100-year period of active institutional controls could be supported (48 FR 39563).

Staff understands that the basis for EPRI's recommendation to extend the duration of active institutional controls may be two-fold. First, it is to better align the domestic policy in this area with international practice. IAEA *General Safety Guide 1*, for example, (IAEA 2009, p. 13) indicates that *some* member countries have in-place a 300-year period of active institutional controls. Second, there is a 1996 analysis evaluating the potential for human intrusion at the U.S. Department of Energy LLW disposal site located in Area 3 of the Nevada National Security Site (formerly the Nevada Test Site). In this analysis (Black and others 1997) the authors found that the likelihood of inadvertent intrusion into the disposal site over a 10,000-year period was, depending on the scenario, 10% or less. In a subsequent presentation of those results by one of the study's authors, it was argued that a longer-duration active institutional control period — between 250 to 300 years — might now be appropriate for near-surface disposal facilities (P. Black/Neptune & Associates, personal communication, June 2012).

| STAKEHOLDER COMMENTS | PRELIMINARY STAFF OBSERVATIONS |
|---|---|
| | <p>Since the 100-year duration for active institutional controls is closely tied to the 10 CFR Part 61 waste classification system, consideration of the duration of institutional controls is more appropriate for the Fiscal Year 2015 initiative to revise and update the § 61.55 waste classification tables.</p> |
| <p>The earlier assumptions concerning certain isotopes cited in the 10 CFR Part 20 Appendix G LLW shipping manifest should be revisited. The isotopes in question are the so-called phantom 4 isotopes (i.e., carbon-14, technetium-99, iodine-129, and tritium). Stakeholders suggested that C-14, Tc-99, and I-129 are being over-estimated in dose assessments because the 10 CFR Part 20 LLW manifest requirement relies on a default value for the purposes of accounting even when the amount of the physical isotope in question is below some lower limit of detection threshold. Chlorine-36 was also cited as an isotope that was also possibly over-reported. It was also suggested the NUREG/BR-0204 needs to be re-written.</p> | <p>In 1982, during the review of the Draft 10 CFR Part 61 EIS that supported the initial proposed rule, commenters questioned the 10 CFR Part 20 manifest reporting requirement for specific radionuclides; the radionuclides in question were C-14, Tc-99, I-129, and H-3. In the 10 CFR Part 61 Final EIS (NRC 1982, p. 5-43), the staff found that these same radionuclides were key contributors to the groundwater pathway dose. As a consequence, the NRC staff reiterated that there was a continued need to report on those four radionuclides. In 1995 revisions to 10 CFR Part 20 (60 FR 15649), the staff continued to maintain the manifest reporting requirement need for these radionuclides.</p> <p>Nevertheless, existing staff guidance found in NUREG/BR-0204 (NRC 1998) might be amended to address the concerns related to the over-reporting of certain radionuclides currently subject to minimum detection limits. Staff intends to conduct a public meeting on this topic in 2013 to explore how the guidance might be updated to reflect improvements in radionuclide detection methods.</p> |
| <p>Criteria for the disposal of greater-than-Class C (GTCC) LLW should be developed.</p> | <p>In 1989, the Commission amended § 61.55(b)(2)(iv) to permit the disposal of GTCC LLW in a geologic repository licensed under 10 CFR Part 60 or in some other type of disposal facility design approved by the Commission (54 FR 22578). Previously, both the Commission (NRC 1989a) and the former Office of Technology Assessment (1989) concluded that given the quantities of GTCC and the likely costs of disposal, a separate disposal facility for GTCC LLW was not justified and that disposal in a deep geologic repository for spent nuclear fuel and other high-level radioactive waste was an acceptable alternative.</p> <p>Consistent with its disposal obligation, the U.S. Department of Energy (DOE or the Department) later issued a Draft EIS for GTCC LLW, for public comment in 2011 (76 FR 10574). In a February 2011 letter (Gelles 2011), DOE invited the NRC to comment of the GTCC Draft EIS. For the purposes of this particular EIS, NRC is a <i>commenting</i> agency. NRC's comments can be found in Camper (2011).</p> |

| STAKEHOLDER COMMENTS | PRELIMINARY STAFF OBSERVATIONS |
|--|--|
| | <p>Before DOE makes a final decision on a disposal method or location, the Department must submit a report to Congress that includes a description of the disposal alternatives under consideration and await Congressional approval. Certain alternatives could involve disposal options that may not require a NRC license under 10 CFR Part 61.</p> |
| <p>Clearance criteria for the disposal of low-activity radioactive waste (LAW) should be developed.</p> | <p>LAW can have radionuclide concentrations greater than background, but at concentrations significantly less than Class A limits. LAW is not defined by the Atomic Energy Act. EPA (1988) has previously suggested that there are as many as 70 potential sources of LAW. EPA (2000) has also suggested that the volume of material in question generated annually is about four orders of magnitude greater in comparison to quantities of so-called classic 10 CFR Part 61 types of LLW (10⁹ ft³ for LAW compared to 10⁵ ft³ for commercial LLW) leading to concerns over competition for limited disposal space at currently operating LLW sites. In Section 10 of the <i>Low-level Radioactive Waste Policy Amendments Act of 1985</i>, Congress directed the NRC to establish standards for identifying radioactive waste streams (i.e., LAW) that might be exempt from regulation under 10 CFR Part 61. Such attempts by the NRC in the past were unsuccessful and in 1992, Congress revoked the Commission's earlier <i>Policy Statements</i> on Below Regulatory Concern pertaining to LAW. See Ryan and others (2007, p. 21).</p> <p>In 2002, the Commission directed the staff to explore and document the feasibility of conditional or restricted clearance of solid materials that originate in restricted or impacted areas of NRC-licensed facilities but which have no, or very small amounts of, residual radioactivity resulting from licensed operations under 10 CFR Part 20. In response, the staff worked with EPA and prepared a draft proposed rule for public comment in 2005. See SECY-05-0054 (NRC 2005). Shortly thereafter, the Commission directed the staff not to make the rule available for public comment, and instead re-directed the staff to continue to evaluate LAW exemption requests using alternate procedures. See Vietti-Cook (2005). Accordingly, licensees may choose to dispose of some LLW at facilities other than 10 CFR Part 61 LLW disposal facilities by using such alternate procedures. (See ML12065A038). Also in 2005, Congress amended the AEA, extending NRC control over additional forms of radioactive material — specifically, short-lived naturally occurring radioactive material (NORM) and naturally-occurring and accelerator-produced radioactive materials (NARM) waste residues. However, this authority did not extend to the more abundant diffuse sources of LAW cited by the EPA in its 2000 study. In 2007, the Commission amended its regulations to include these additional radioactive materials consistent with Section 11(e)(3) of the Atomic Energy Act, as amended (NRC 2007).</p> |

| STAKEHOLDER COMMENTS | PRELIMINARY STAFF OBSERVATIONS |
|----------------------|---|
| | <p>In 2003, EPA issued an advance notice of proposed rulemaking or ANPR (68 FR 65120), seeking comment on approaches to ensure a more consistent approach to the management of LAW. No action has been taken since publication of the ANPR.</p> <p>In 2005, the Commission previously decided to defer any decision making on LAW.²</p> <p>Finally, in 2008, in response to a Commission request, NRC's former Advisory Committee on Nuclear Waste and Materials examined the LAW disposal issue. That review found that some States permitted the disposal of LAW in both Subtitle-C (hazardous) and Subtitle-D (municipal) disposal facilities, licensed under the Resource Conservation and Recovery Act (RCRA) regulations, depending on whether the waste stream in question was chemically-mixed. See Ryan (2008).</p> |

References

Black, P., B. Moore, B. Crowe, M. Hooten, K. Black, S. Rawlinson, and L. Barker, "A common-sense probabilistic approach to assessing inadvertent human intrusion into low-level radioactive waste at the Nevada Test Site," in *Proceedings of the Waste Management '97 Conference, March 2-7, 1997, Tucson, Arizona*, Conference Preprint LA-UR-97-728.

Camper, L.W., Director, Division of Waste Management and Environmental Policy/U.S. Nuclear Regulatory Commission, Letter to C. Gelles, Office of Disposal Operations/U.S. Department of Energy, Subject: "Response to the Department of Energy's Request for the U.S. Nuclear Regulatory Commission's Perspective on Four Specific Topics in the Draft Environmental Impact Statement for the Disposal of Greater-than-Class C (GTCC) Low-Level Radioactive Waste and GTCC-Like Waste," August 5, 2011. [ML111800487]

Gelles, C., Director, Office of Disposal Operations/U.S. Department of Energy, Letter to L.W. Camper, Director, Division of Waste Management and Environmental Policy/U.S. Nuclear Regulatory Commission, General Subject: "DOE's 2011 Draft Environmental Impact Statement of GTCC and GTCC-like LLW," February 16, 2011. [ML110690783]

International Atomic Energy Agency, "Classification of Radioactive Waste. General Safety Guide," Vienna, IAEA General Safety Standards Series No. GSG-1, 2009.

² See SRM-SECY-05-0054, dated June 1, 2005.

International Commission on Radiological Protection, “The 2007 Recommendations of the International Commission on Radiological Protection,” *Annals of the ICRP*, Vol. 37, Nos. 2-4, 2007. [ICRP Publication 103.]

James, D., T. Kalinowski, and J. Bohnsak, “Options for Improved Low Level Waste Disposal Using 10 CFR 61.58,” Palo Alto, Electric Power Research Institute, Technical Report 1021098, December 2010.

U.S. Environmental Protection Agency, “Criteria for Radioactive Wastes [Invitation for Comment: Environmental Protection];” *Federal Register*, vol. 43, no. 221, pp. 53262-53267, November 15, 1978.

U.S. Environmental Protection Agency, “Environmental Radiation Protection Standards for Low-Level Radioactive Waste Disposal [Advanced Notice of Proposed Rulemaking];” *Federal Register*, vol. 48, no. 170, p. 39563, August 31, 1983.

U.S. Environmental Protection Agency, “Evaluation of EPA’s Guidelines for Technologically Enhanced Naturally Occurring Radioactive Materials (TENORM) – Report to Congress,” EPA 402-R-00-01, June 2000.

U.S. Environmental Protection Agency, “Approaches to an Integrated Framework for Management and Disposal of Low-Activity Waste: Advance Notice of Proposed Rulemaking,” *Federal Register*, Vol. 68, No. 222, pp. 65119–65151, November 18, 2003.

U.S. Department of Energy, “Notice of Availability of the Draft Environmental Impact Statement for the Disposal of Greater-Than-Class C (GTCC) Low-Level Radioactive Waste and GTCC–Like Waste, and Notice of Public Hearings [Notice of Availability],” *Federal Register*, Vol. 76, No. 38, pp. 10574–10577, February 25, 2011.

U.S. Nuclear Regulatory Commission, “Licensing Requirements for Land Burial of Radioactive Waste: Proposed Rulemaking,” *Federal Register*, Vol. 46, No. 142, pp. 38081–38105, July 24, 1981.

U.S. Nuclear Regulatory Commission, “Draft Environmental Impact Statement on 10 CFR Part 61: Licensing Requirements for Land Disposal of Radioactive Wastes,” Office of Nuclear Material Safety and Safeguards, NUREG-0782, 4 vols., September 1981.

U.S. Nuclear Regulatory Commission, “Final Environmental Impact Statement on 10 CFR Part 61: Licensing Requirements for Land Disposal of Radioactive Wastes,” Office of Nuclear Material Safety and Safeguards, NUREG-0945, 3 vols., November 1982.

U.S. Nuclear Regulatory Commission, “Licensing Requirements for Land Disposal of Radioactive Waste: Final Rule,” *Federal Register*, Vol. 47, No. 248, pp. 57446–57482, December 27, 1982.

U.S. Nuclear Regulatory Commission, “Disposal of Radioactive Wastes: Final Rule,” *Federal Register*, Vol. 54, No. 100, pp. 22578–22583, May 25, 1989.

U.S. Nuclear Regulatory Commission, "Regulating the Disposal of Low-Level Radioactive Waste. A Guide to the U.S. Nuclear Regulatory Commission's 10 CFR Part 61," Office of Nuclear Material Safety and Safeguards, NUREG/BR-0121, August 1989.

U.S. Nuclear Regulatory Commission, "Low-Level Waste Shipment Manifest Information and Reporting: Final Rule," *Federal Register*, Vol. 60, No. 58, pp. 15649–15667, March 27, 1995.

U.S. Nuclear Regulatory Commission, "Instructions for Completing NRC's Uniform Low-level Radioactive Waste Manifest," NUREG/BR-0204, July 1998.

U.S. Nuclear Regulatory Commission, "Proposed Rule: Radiological Criteria for Controlling the Disposition of Solid Materials (RIN 3150-AH18)," SECY-05-0054, March 31, 2005. [ML050750495]

U.S. Nuclear Regulatory Commission, "Requirements for Expanded Definition of Byproduct Material: Proposed Rule," *Federal Register*, Vol. 71, No. 145, pp. 42952–42994, July 28, 2006.

U.S. Nuclear Regulatory Commission, "Final Rule: Requirements for Expanded Definition of Byproduct Material (RIN: 3150-AH84)," SECY-07-0062, May 14, 2007. [ML070720153]

Office of Technology Assessment, "An Evaluation of Options for Managing Greater-Than-Class C Low-Level Radioactive Waste – Background Paper," U.S. Congress, OTA-BP-0-50, October 1988.

Ryan, M.T., M.P. Lee, and H.J. Larson, "History and Framework of Commercial Low-Level Radioactive Waste Management in the United States: ACNW White Paper," U.S. Nuclear Regulatory Commission, NUREG-1853, January 2007.

Ryan, M.T., Chairman/Advisory Committee on Nuclear Materials and Waste, Letter to the Honorable D.E. Klein, Chairman/U.S. Nuclear Regulatory Commission, Subject: Advisory Committee on Nuclear Materials and Waste Low-Activity Radioactive Waste Working Group Meeting of February 13-14, 2008," April 30, 2008. [ML081220463]

Vietti-Cook, A.L., Secretary/U.S. Nuclear Regulatory Commission, Memorandum to L.A. Reyes, Executive Director for Operations/ U.S. Nuclear Regulatory Commission, Subject: "Staff Requirements – SECY-05-0054 – Proposed Rule: Radiological Criteria for Controlling the Disposition of Solid Materials (RIN 3150-AH18)," June 1, 2005. [ML051520185]