

GTCC LLW: Historical and Contemporary Perspectives

J. Scott Kirk, CHP

June 8, 2023



Texas Legislation and Petition for Rulemaking



- **Texas Health & Safety Code, Sec. 401.2005(4)**
 - “Federal facility waste” means low-level radioactive waste that is the responsibility of the federal government under the Low-Level Radioactive Waste Policy Act, as amended by the Low-Level Radioactive Waste Policy Act of 1985.
- **Rulemaking in Texas Administrative Code promulgated to implement Health & Safety Code placed restrictions prohibiting disposal of GTCC LLW**
- **Petition for Rulemaking was submitted to better align and provide consistency with disposal requirements in 10 CFR 61 with TCEQ**

July 21, 2014

PETITION FOR ADOPTION OF RULES

Waste Control Specialists LLC (“WCS”) hereby petitions the Texas Commission on Environmental Quality (“TCEQ”) for adoption of rules to revise Chapter 336, *Radioactive Substance Rules*, of Title 30 of the Texas Administrative Code (“TAC”).

Name and Address of Petitioner

Waste Control Specialists LLC
c/o Rod Baltzer, President
5430 LBJ Freeway
Suite 1700
Dallas, Texas 75240-2620

Purpose of the Proposed Rules

Certain existing regulations in 30 TAC Chapter 336 concerning “low-level radioactive waste” and “federal facility waste” are inconsistent with the Texas Radiation Control Act (“TRCA”) and the federal Low-Level Radioactive Waste Policy Amendments Act of 1985 (“LLWPAA”). Under the TRCA and the LLWPAA, the term “federal facility waste” includes certain low-level radioactive waste (“LLW”) that is classified as greater than Class C (“GTCC”) LLW and other waste known as GTCC-like LLW.¹ TCEQ’s current regulations, however, define the term “federal facility waste” differently than the TRCA by expressly excluding GTCC LLW from the definition. Similarly, TCEQ’s regulatory definition of “low-level radioactive waste” differs from the definition of that term in the TRCA by expressly excluding transuranic (“TRU”) waste, and, while the TRCA does not define “transuranic waste,” the TCEQ’s definition differs from the definition used by the U.S. Environmental Protection Agency (“EPA”) and other relevant agencies. TCEQ should amend these regulatory definitions to make them consistent with the statutes and with relevant federal regulations.

Under the TRCA, TCEQ is authorized to license disposal of certain GTCC LLW and GTCC-like LLW. There is an acute need for safe, permanent disposal options for this LLW. The TRCA establishes the framework for the Federal Facility Waste Disposal Facility (“FWF”) precisely so that a disposal facility can be made available for federal facility waste. Pursuant to the TRCA, TCEQ licensed and WCS constructed and operates the FWF in Andrews County, Texas. However, the FWF cannot currently accept GTCC LLW or GTCC-like LLW for disposal. The changes proposed in this petition will provide TCEQ with flexibility authorized by the TRCA.

Aligning the regulatory definitions of “low-level radioactive waste” and “federal facility waste” with the definitions of those terms in statute will not automatically allow WCS to accept GTCC LLW or GTCC-like LLW. The disposal of that waste, as contemplated by the Texas

¹ LLW generated or owned by the United States Department of Energy (“DOE”) is encompassed by the TRCA’s definition of “federal facility waste.” However, such DOE waste is not classified according to the classification system developed by the Nuclear Regulatory Commission (“NRC”). Thus, certain DOE waste that possesses the same characteristics as GTCC waste is known as “GTCC-like LLW.”

Salient Points Sought in Petition



Section 274 c.(4)

- **Petition sought to clarify Agreement States authorized to regulate disposal of GTCC LLW pursuant to Section 274 c.(4) of Atomic Energy Act of 1954 (AEA)**
 - NRC had not determined by regulation or order requirements prohibiting Agreement States from licensing disposal of GTCC LLW
- **Petition sought to clarify disposal of GTCC LLW authorized in a near surface disposal facility licensed under Part 61**
- **Recognized that exclusions in the definition of TRU in regulation and federal legislation authorizes disposal based on the degree of isolation required to protect public health**
- **Petition recognized that Part 61.2 had not been revised removing transuranic exclusionary language from definition of LLW as stipulated in LLWPAA of 1985**
- **Effectively orphaned certain waste with transuranic radionuclides exceeding 100 nCi/g**

c. No agreement entered into pursuant to subsection b. shall provide for discontinuance of any authority and the Commission shall retain authority and responsibility with respect to regulation of—

- (1) the construction and operation of any production or utilization facility or any uranium enrichment facility;³⁷¹
- (2) the export from or import into the United States of byproduct, source, or special nuclear material, or of any production or utilization facility;
- (3) the disposal into the ocean or sea of byproduct, source, or special nuclear waste materials as defined in regulations or orders of the Commission;
- (4) the disposal of such other byproduct, source, or special nuclear material as the Commission determines by regulation or order should, because of the hazards or potential hazards thereof, not be so disposed of without a license from the Commission.

In 1985, EPA defined TRU as waste in 40 CFR 191, *Environmental Radiation Protection Standards for Management and Disposal of Spent Nuclear Fuel, High Level Waste and Transuranic Radioactive Wastes*, as waste containing more than 100 nCi/g of alpha-emitting transuranic isotopes, with half lives greater than 20 years, except for

- (1) High-level radioactive wastes;
- (2) wastes that the Department has determined, with the concurrence of the Administrator, do not need the degree of isolation required by this part; or
- (3) wastes that the Commission has approved for disposal on a case-by-case basis in accordance with 10 CFR 61.

- **Modeled waste stream identified in DOE Draft EIS to assess performance criteria against Subtitle C of Part 61**
- **Recognized that disposal of GTCC LLW in an arid environment greatly improve performance as compared to humid environments**
- **Enhanced waste packaging and depth of disposal recognized as nearly equal important disposal criteria**
- **Focused mainly on providing disposal pathways for non-defense related TRU**
- **Disposal at depth greater than 30 m possible**
- **DOE EIS Preferred Alternative**
- **Report to Congress as mandated by EPLRA of 2005**
- **Texas legislative and licensing requirements for DOE to take title of waste and disposal facility**

Briefings Before Commissioners



- On July 17, 2015, NRC issued SECY-15-0094, Historical and Current Issues Related to Disposal of GTCC LLW
- Commission recognized that Agreement States authorized to license disposal of GTCC LLW
- Briefing before Commissioners held soon thereafter
- Recognized disposal of GTCC LLW authorized pursuant to 61.55(a)(2)(iv)
- Acknowledged certain transuranic waste in excess of 100 nCi/g orphaned in commercial section until completing rulemaking
- Commissioners' directed staff to first conduct an analysis of the hazards associated with disposal of GTCC LLW in a near surface disposal facility

POLICY ISSUE
Notation Vote

July 17, 2015 SECY-15-0094

TO: The Commissioners

FROM: Mark A. Satorius /RA/
Executive Director for Operations

SUBJECT: HISTORICAL AND CURRENT ISSUES RELATED TO DISPOSAL OF GREATER-THAN-CLASS C LOW-LEVEL RADIOACTIVE WASTE

PURPOSE:
To provide the Commission with an historical perspective on disposal of Greater-Than-Class C (GTCC) low-level radioactive waste (LLRW) and to seek Commission approval of the staff's recommendation to allow the State of Texas to license the disposal of GTCC waste. Resolution of this issue would support a response to the Texas Commission on Environmental Quality's (Texas) January 2015 inquiry regarding whether it possesses the authority to license a GTCC waste disposal cell that would receive GTCC, GTCC-like,¹ and transuranic (TRU) waste streams.

SUMMARY:
The Low-Level Radioactive Waste Policy Amendments Act of 1985 (Amendments Act) states that U.S. Nuclear Regulatory Commission (NRC) licensee generated GTCC waste "shall be disposed of in a facility licensed by the [NRC]."² In 1989, the NRC promulgated a regulation specifying that GTCC waste must be disposed of in a geologic repository licensed by the NRC unless the Commission approves an alternative proposal.² In September 2014, the Commission directed the staff to provide an historical perspective on GTCC waste disposal in Staff Requirements Memorandum (SRM)-M1-0091B, "Briefing on Management of Low-Level Waste, High-Level Waste, and Spent Nuclear Fuel."

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(301) 415-2432

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¹ For purposes of this paper, "GTCC waste" refers to that waste produced as a result of Atomic Energy Act (AEA)-licensed activities and "GTCC-like waste" is U.S. Department of Energy (DOE) generated or owned LLRW that may also contain TRU wastes with characteristics similar to GTCC. This paper is focused on AEA licensee generated GTCC and TRU waste.
² See Title 10 of the Code of Federal Regulations (CFR) § 61.55(a)(2)(iv).

NRC Commissioner Jeffery Baran
Commission Vote Record (SECY-15-0094)

"I have been impressed by the thoughtful, problem solving approach that all have brought to this challenging matter. If resolving the GTCC disposal issues were easy, we would not be here 30 years after the Amendments Act still pondering fundamental questions about which agency has the responsibility to license a GTCC waste disposal facility."

- **NRC established the waste classification limits based on disposal of the known or expected waste stream characteristics identified as part of the initial Part 61 rulemaking completed in 1982**
- **Based on fate and transport pathway analysis conducted in a humid environment for the disposal of 23 commercial decommissioned nuclear reactors on the east coast**
- **Limits for Class C LLW established based on radiation dose criteria intended to protect against human intrusion**
- **Radiation dose limits to an inadvertent human intrusion into a waste form established at 500 mrem/y or equivalent to the limits stipulated in 10 CFR 20 for members of the general public**
- **Exception in proposed rule were limits for disposal criteria for transuranic radionuclides**
- **Based on dosimetric/biokinetic models based on the International Commission of Radiological Protection, Report 2 titled, *Permissible Dose for Internal Radiation*, published in 1959**

Protection of inadvertent intruder paramount

6. WASTE CLASSIFICATION

Based upon the analyses in Chapters 4 and 5, there are two fundamental mechanisms to classify wastes for long-term hazard:

1. Consideration of potential hazard to an inadvertent intruder due to direct contact with the disposed waste; and

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after institutional controls have lapsed. These wastes are termed Class C intruder wastes and are also defined in terms of allowable concentrations of isotopes and requirements for disposal by deeper burial or some other barrier.

Upper concentration limits are also defined for Class C waste. Wastes containing concentrations higher than the upper limits would be generally unacceptable for near-surface disposal. The disposal of such wastes should be subject to case-by-case determinations depending upon the specific waste forms and disposal techniques. In addition, four isotopes--H-3, C-14, I-129 and Tc-99--require site-specific inventory considerations to assure the performance objective for long-term environmental protection is not exceeded.

Technical basis of limits for TRU

6.3 Transuranic Isotopes

Based upon work performed for this environmental impact statement as well as work performed by others, NRC decided not to raise the existing working limit of 10 nCi/gm for transuranic isotopes. This decision is based on several factors. For most of the alpha-emitting transuranic radionuclides, the maximum average concentrations calculated were in the range of 10 nanocuries per gram. As noted above, these concentrations are conservative in that they do not consider credit for dilution by other wastes.

In the spirit of the ALARA concept, the lower value of 10 nCi/gm has been demonstrated as an achievable concentration to control the disposal of transuranic nuclides by near-surface disposal. This value has been imposed by the Department of Energy for some eleven years and by most of the commercial disposal site operators for nearly that long. The last commercial site imposed the 10 nCi/gm restriction in 1979. In addition, it is believed that most of the potential for economic gain that would result from a higher limit (say in the range of 100 nCi/gm) could be negated by current limitations in routine measurement techniques. There is also a tendency toward a more conservative assessment of the hazard of certain transuranic nuclides (e.g., as in ICRP-30) and it does not seem prudent at this time to use higher values. In adopting the existing limit of 10 nCi/gm, NRC staff recognizes that the principal concern regarding potential future health hazards of TRU disposal is due to long-lived alpha activity. One exception to this rule would be Pu-241, which is a beta emitter which decays with a 13.2 year half-life to Am-241, which is an alpha emitter having a half-life of 458 years. The ratio of the specific activity of Pu-241 to Am-241 is about 35. Thus, to maintain an equivalent limit for alpha emitters of 10 nCi/gm, a limit of 350 nCi/gm will be allowed for Pu-241.

Understanding Regulatory Basis of TRU Disposal Limits (100 nCi/g)



TRU Limits Based on Radiation Detection Limitations, Not Analysis of Radiation Doses to Protect Inadvertent Intruder

- **AEA defined TRU as waste with transuranic radionuclides in excess of 10 nCi/g or in such concentrations as the NRC may prescribe to protect public health and safety**
- **The NRC established limits for TRU for certain alpha-emitting radionuclides in excess of 100 nCi/g in original Part 61 rulemaking in 1982**
- **Statements of Consideration in the original Part 61 rulemaking**
 - Raised from 10 to 100 nCi/g because of concerns that the radiation survey instruments at the time were insufficient to measure transuranic radionuclides at such low concentrations

relatively nonvariant are generally preferred. Individual licensees may also continue to request amendments for alternative disposal methods for the licensee's own waste pursuant to § 20.302.

Of all the values proposed in Table 1, the limits for contamination by alpha emitting transuranic elements received the most attention and comments. There were a number of issues raised related to the allowable concentration, ranging from its validity to the impacts of meeting the limit. By far the most comments were related to the magnitude of the limit. Of the 23 commenters on the transuranic issue, four thought the 10 nCi/gm limit should be retained or lowered, while the remaining 19 suggested that the limit be raised. Those who suggested that the limit be raised presented a number of supporting arguments. Many, if not most, of the commenters suggested that the limit could be safely raised to 100 nCi/gm. One argument given is the advantage of enforceability of the higher limit. With current measurement techniques, it is argued that it is very difficult if not impossible to certify that waste contains less than 10 nCi/gm, but much less difficult to certify that it is less than 100 nCi/gm. Others pointed out that a 100

In response to these comments, the Commission has reevaluated the analyses for disposal of waste containing transuranic nuclides, in an attempt to temper unnecessarily conservative assumptions, such as not considering the dilution by other wastes that decay to essentially inert levels with time, so that more realistic estimates of consequences will result. As a result, disposal limits for Class C, waste have been raised to 100 nCi/gm for long lived alpha emitting transuranic nuclides. For Class A wastes, the limit remains at 10 nCi/gm. The details and results of these analyses are presented in the Final Environmental Statement supporting Part 61.

Several commenters wanted to know what to do with waste containing Radium-226, a radioisotope which is not currently listed. It appears that there are two types of radium wastes to be considered: (1) small concentrated sources of radium such as radiation sources or luminescent dials, and (2) wastes which contain small amounts of radium incidental to other radioisotopes, such as radium contained in wastes from uranium separation processes. The former is not subject to regulation by the Commission, since radium is a naturally-occurring isotope

Federal Register, Vol. 47 No. 248, published on December 27, 1982

TCEQ Commissioners' Directives



- TCEQ Commissioners unanimously approved the Petition on September 19, 2014
- Directed staff to reach out to federal counterparts to seek clarification on jurisdiction and authority to regulate disposal of GTCC, before proceeding with a rulemaking
- On January 30, 2015, TCEQ submitted letter to the NRC requesting clarification on its jurisdiction and authority to regulate disposal of GTCC LLW
- Importance of letter cannot be overstated as it set in motion GTCC LLW rulemaking currently being drafted by NRC

**DECISION OF THE COMMISSION
REGARDING THE PETITION FOR RULEMAKING
FILED BY WASTE CONTROL SPECIALISTS LLC**

Docket No. 2014-0902-RUL
Rule Project No. 2014-028-PET-NR


On September 10, 2014, the Texas Commission on Environmental Quality (Commission) considered the petition for rulemaking filed by the Waste Control Specialists LLC, otherwise known as the "petitioner." The petitioner filed its petition on July 21, 2014 with the Office of the Chief Clerk requesting that the commission amend 30 TAC Chapter 336, Radioactive Substances Rules to better align certain definitions and disposal criteria in Chapter 336 with state and federal statutes and regulations.

IT IS THEREFORE ORDERED BY THE COMMISSION pursuant to Administrative Procedure Act, Texas Government Code, § 2001.021 that the executive director initiate rulemaking.

This Decision constitutes the decision of the Commission required by the Texas Government Code, § 2001.021(c).

Issue date: SEP 19 2014

TEXAS COMMISSION ON
ENVIRONMENTAL QUALITY


Bryan W. Shaw, Ph.D., P.E., Chairman

Steve W. Shaw, Ph.D., P.E., Chairman
Toby Baker, Commissioner
Rob Coker, Commissioner
Richard S. Hahn, Ph.D., Executive Director


TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
Promoting Smart and Sustainable Development

January 30, 2015

Lesley Duffin, Director
Division of Nuclear Safety, State, Tribal, and Rulemaking Programs
Office of Nuclear Material Safety and Safeguards
U.S. Nuclear Regulatory Commission
Two White Flint North
1400 Rockville Pike
Rockville, Maryland 20850

Re: Authority and Jurisdiction Greater Than Class-C GTCC/Like Waste Streams

Dear Ms. Duffin:

On September 10, 2014, the Texas Commission on Environmental Quality (TCEQ) considered a petition by Waste Control Specialists LLC (WCSL) requesting a change to TCEQ rules to remove prohibitions against disposal of Greater Than Class-C (GTCC/Like Waste, GTCC-Like Waste, and Transuranic (TRU) Waste at its TCEQ licensed facilities. Current Texas law as well as federal law does not establish a clear regulatory pathway for disposal of GTCC types of waste streams. The TCEQ Commission requested that federal stakeholders disseminate information regarding potential amendments to Texas rules related to disposal of the GTCC waste streams, including definitions associated with those waste streams in a manner that is consistent with applicable federal and state law.

In order to ensure an informal stakeholder process, it is critical to have accurate information from our federal counterparts regarding Agreement State activities and compatibility. Related to WCSL petition efforts, NRC has provided to TCEQ detailed examples (see attached letter from NRC) for disposal of potential types of GTCC waste streams should Texas rules be changed and a license amendment be approved. We respectfully request that Nuclear Regulatory Commission (NRC) respond specifically regarding these illustrative examples.

In addition, in phone conversations and meetings that occurred September 2014 - January 2015, TCEQ staff requested that TCEQ initiate, in writing, questions regarding Texas authority to license the disposal of GTCC waste streams. Those questions are:

- Does Texas rule as an Agreement State per federal statute and NRC rules in 10 Code of Federal Regulations 27.45 include 27.45 of the 1952 Atomic Energy Act authorizes promulgation of state rules (see Texas Administrative Code 39.356.066.03AHD, 39.356.066.03AHD/Appendix E) and 39.356.066.03AHD that could license GTCC waste streams for disposal?
- Considering the fact that the Department of Energy (DOE) currently holds or is required to take possession of all GTCC and GTCC-Like material, and considering that some of that material exhibits TRU characteristics and may currently be considered to include GTCC, GTCC-Like, and material exhibiting TRU characteristics, could the State of Texas authorize the disposal of those materials? If not, is there some pathway to allow for disposal?

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Draft Regulatory Analysis for GTCC LLW



- **NRC subsequently published a Draft Regulatory Analysis that included potential limits and disposal criteria for GTCC LLW**
- **NRC evaluation was based on a generic analysis of 17 waste streams provided in the DOE EIS for GTCC LLW**
- **Depth of disposal of at least 5 m AND contained within an engineered barrier to prevent human intrusion designed to last at least 500 y**
- **Concluded that most of GTCC LLW could be dispositioned in the near surface disposal facility (30 m)**
- **Disposal of up to 10,000 nCi/g of TRU would be suitable in a near surface disposal facility**
- **Also concluded that most GTCC LLW could be licensed by Agreement States**
- **NRC Commissioners directed staff to proceed with a rulemaking to consolidate GTCC LLW criteria with the ongoing Part 61 rulemaking on April 5, 2022**
- **Staff plans to submit draft rulemaking to Commissioners in October 2023**



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20545-0001

SECRETARY

MEMORANDUM TO:

Daniel H. Dorman
Executive Director for Operations

FROM:

Brooke P. Clark, Secretary Brooke P. Clark

SUBJECT:

STAFF REQUIREMENTS – SECY-20-0096 – PATH FORWARD
AND RECOMMENDATIONS FOR CERTAIN LOW-LEVEL
RADIOACTIVE WASTE DISPOSAL RULEMAKINGS

The Commission has approved the staff's recommended Option 1, to issue a new proposed rule that consolidates and integrates criteria for licensing the disposal of greater-than-Class C (GTCC) waste and Title 10 of the Code of Federal Regulations (10 C.F.R.) Part 61, "Low-Level Radioactive Waste Disposal," rulemaking activities, and provides for Agreement State licensing of those GTCC waste streams that meet the regulatory requirements for near-surface disposal and do not present a hazard such that the NRC should retain disposal authority. Additionally, for GTCC waste streams containing strategic special nuclear material, the Commission has approved the staff's recommendation to explore regulatory approaches that would allow for a single regulator for an Agreement State licensee disposing of GTCC waste in a land disposal facility, including potential amendment to 10 C.F.R. §§ 150.14 and 150.15.

The staff should take another look at the technical basis for the performance objectives in Part 61 and ensure that the compliance period is based on scientific data. Rather than using the same compliance period for disposal sites containing significant amounts of depleted uranium, GTCC, or transuranic waste, the staff should consider a site-specific, graded approach based on when the peak dose is projected to occur or establish a longer compliance period for disposal sites containing significant quantities of mobile, long-lived radionuclides.

If during its development of the new proposed rule the staff determines that provisions in the final rule provided to the Commission in SECY-19-0196 are protective of public health and safety, including for long-lived radionuclides, the staff should propose those provisions to the Commission.

cc: Chairman Hanson
Commissioner Baran
Commissioner Wright
OGC
CFO
OCA
OPA
ODs, RAs, ACRS, ASLBP
PDR

TRU Near Surface Disposal Limits



NRC Draft Regulatory Analysis

Table 3-3 GTCC Waste Streams Sorted by Concentration of TRU Radionuclides

Waste Streams	Waste Stream	Volume (m ³)	Waste Type	Contact (CH) or Remote (RH) Handled	TRU Concentrations ¹ (half-lives > 5 years) (nCi/g)
Waste Streams with TRU radionuclides equal to or less than 100,000 nCi/g					
Sealed Sources – Small	sealed sources	1,800	GTCC	CH	85,900 (Am-241:54%, Pu-238: 43%)
WVDP Decontamination	other waste	540	GTCC-like	RH	13,300 (Am-241: 41%)
Waste Streams with TRU radionuclides equal to or less than 10,000 nCi/g					
Exhumation – SDA-SNAP	other waste	1,200	GTCC Potential	CH	9,600 (Pu-238: 100%)
WVDP Decommissioning	other waste	220	GTCC-like Potential	CH	6,700 (Am-241: 52%)
WVDP Decontamination	other waste	710	GTCC-like	CH	5,700 (Am-241: 50%)
WVDP Decommissioning	other waste	760	GTCC-like Potential	RH	3,500 (Am-241: 53%)
WVDP Exhumation – NDA	activated metals	210	GTCC Potential	RH	3,200 (Am-241: 57%)
Pu-238 Production	other waste	260	GTCC-like Potential	RH	1,900 (Pu-238: 99%)
Waste Streams with TRU radionuclides equal to or less than 1,000 nCi/g					
WVDP Exhumation – NDA	other waste	1,900	GTCC Potential	RH	530 (Am-241: 56%)
Exhumation – SDA	other waste	400	GTCC Potential	CH	310 (Pu-238: 70%)
Mo-99 Production – MURR	other waste	35	GTCC Potential	RH	300 (Pu-239: 100%)
Pu-238 Production	other waste	120	GTCC-like Potential	CH	160 (Pu-239: 37%, Am-241: 32%)
Mo-99 Production – MIPS	other waste	355	GTCC Potential	RH	150 (Pu-239: 97%)
Waste Streams with TRU radionuclides equal to or less than 100 nCi/g					
Exhumation – SDA	activated metals	525	GTCC Potential	RH	24 (Pu-238: 49%)
Reactors	activated metals	880	GTCC	RH	3
Reactors	activated metals	370	GTCC Potential	RH	3
Sealed Sources – Large	sealed sources	1,000	GTCC	CH	0

¹ Concentrations of TRU based on DOE 2016 except for reactors that is based on McCartin et al 2018 due to discrepancies in DOE 2016 for deriving values for that waste stream.

Table 3-4 Suitability of GTCC Waste Stream for Near-Surface Disposal and Agreement State Regulatory Oversight

	GTCC Volume (m ³)	Potentially Suitable for Near-Surface Disposal	Potentially Suitable for Agreement State Regulation
EXISTING FACILITIES AND ACTIVITIES			
Commercial Reactors (activated metal)	RH ¹ 880		
Sealed Sources (Cs-137)	CH 1,000		
Sealed Sources (neutron irradiators)	CH 1,800	No	No
West Valley Decontamination of MPPB (other waste)	CH 710		
	RH 540	No	No
POTENTIAL FACILITIES AND ACTIVITIES (Potential GTCC Waste)			
Commercial Reactors (activated metal)	RH 370		
Mo-99 Production (MURR)	RH 35		
Mo-99 Production (MIPS)	RH 355		No
West Valley Exhumation (NDA) (activated metal)	RH 210		
West Valley Exhumation (NDA) (other waste)	RH 1,900		
Exhumation (SDA) (other waste)	CH 400		
Exhumation (SDA) (activated metal)	RH 525		
Exhumation (SDA-SNAP) (other waste)	CH 1,200		
West Valley Decommissioning of MPPB and WVTF (other waste)	CH 220		
	RH 760		
Pu-238 Production (other waste)	CH 120		
	RH 260		

¹ Waste containers that are either contact-handled (CH) or remote-handled (RH)

Final Thoughts: Important Considerations for Rulemaking



- **Completion of rulemaking marks an important milestone in the management and disposal of LLW**
- **Pursuant to Section 274c.(4) of AEA, an order or regulation must be established to grant exclusive licensing authority to the NRC to:**
 - Approve disposal of waste with greater than 10,000 nCi/g of transuranic radionuclides, and
 - Approve disposal of GTCC LLW at depths greater than 30 m
- **Such changes could be incorporated in an expansion of 10 CFR 61.55(a)2.(iv) during rulemaking, or elsewhere**
- **TRU waste discrepancy resolution - LLWPAA is public law,**
- **Other issues related to physical security and nuclear criticality safety may be challenging for implementation of rule**
- **Limits of 100 nCi/g established in regulations and federal legislation, but existing regulatory framework exists but have not yet been implemented**

§ 61.55 Waste classification.

(a) Classification of waste for near surface disposal. (1) Considerations. Determination of the classification of radioactive waste involves two considerations. First, consideration must be given to the concentration of long-lived radionuclides (and their shorter-lived precursors) whose potential hazard will persist long after such precautions as institutional controls, improved waste form, and deeper disposal have ceased to be effective. These precautions delay the time when long-lived radionuclides could cause exposures. In addition, the magnitude of the potential dose is limited by the concentration and availability of the radionuclide at the time of exposure. Second, consideration must be given to the concentration of shorter-lived radionuclides for which requirements on institutional controls, waste form, and disposal methods are effective.

(2) Classes of waste. (i) Class A waste is waste that is usually segregated from other waste classes at the disposal site. The physical form and characteristics of Class A waste must meet the minimum requirements set forth in § 61.56(a). If Class A waste also meets the stability requirements set forth in § 61.56(b), it is not necessary to segregate the waste for disposal.

(ii) Class B waste is waste that must meet more rigorous requirements on waste form to ensure stability after disposal. The physical form and characteristics of Class B waste must meet both the minimum and stability requirements set forth in § 61.56.

(iii) Class C waste is waste that not only must meet more rigorous requirements on waste form to ensure stability but also requires additional measures at the disposal facility to protect against inadvertent intrusion. The physical form and characteristics of Class C waste must meet both the minimum and stability requirements set forth in § 61.56.

(iv) Waste that is not generally acceptable for near-surface disposal is waste for which form and disposal methods must be different, and in general more stringent, than those specified for Class C waste. In the absence of specific requirements in this part, such waste must be disposed of in a geologic repository as defined in part 60 or 63 of this chapter unless proposals for disposal of such waste in a disposal site licensed pursuant to this part are approved by the Commission.