Advocates for Responsible Disposal in Texas

Greater-Than-Class C (GTCC) Low-Level Radioactive Waste—A Primer

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Introduction

Federal policy concerning the management and disposal of Greater-Than-Class C (GTCC) low-level radioactive waste (LLRW) is in transition. Discussions are also taking place at the state level about the best path forward for the safe management of this waste. Advocates for Responsible Disposal in Texas (ARDT) has developed this primer to provide a broad overview of the issue, identify key regulatory agencies, and answer common questions. ARDT used publicly available sources provided by the U.S. Nuclear Regulatory Commission (NRC), the U.S. Department of Energy (DOE), and the Texas Commission on Environmental Quality (TCEQ) in the development of this document.

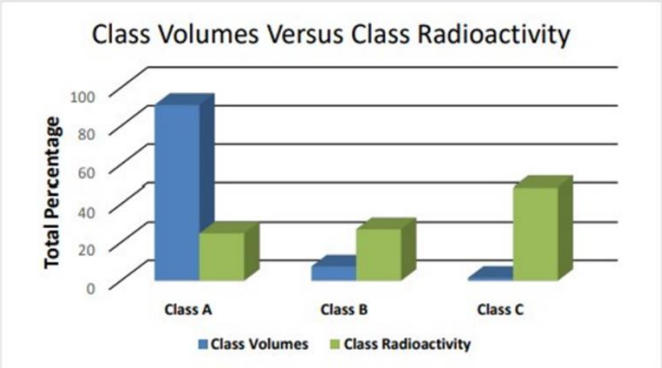
What is GTCC?

GTCC is one of the four "classes" of LLRW. It is not high-level radioactive waste, such as spent fuel rods from a nuclear power plant or research reactor.

NRC classifies LLRW according to its hazard. The level of regulation increases as the radioactive concentration increases. These are the four classes of LLRW:

- Class A, which contains the lowest concentration of radioactivity and constitutes about 91 percent of the volume of LLRW generated in the United States.
- Classes B and C, which contain higher concentrations of radioactivity as compared to Class A. They make up almost 9 percent of LLRW volume, but account for 75 percent of the total radioactivity of all LLRW.
- GTCC Waste contains the highest concentrations of radioactivity as compared to Class A, B, and C LLRW, but only **makes up less than one percent of the total LLRW volume nationally.**

For reference, the figure below is from a TCEQ report to the 87th Legislature (see sources) and shows the relative volumes and radioactivity of Classes A, B, and C waste.



Where does GTCC Come From?

According to DOE, GTCC is generated by universities, hospitals, nuclear utilities, fuel fabrication plants, sealed source manufacturers, and various other industries. Commercial nuclear power reactors and university research reactors, for example, can generate metals whose radioactivity concentrations exceed Class C LLRW.

It's important to note, GTCC wastes contain the same radioactive isotopes as other Class A, B, or C LLRW, but in a smaller volume which makes the concentrations higher. As such, GTCC wastes are not unique in their radiological characteristics.

You may hear reference to "reactor-related" GTCC. Reactor-related GTCC is generated as a result of nuclear plant operations and decommissioning. GTCC waste generated at a nuclear plant can include fuel-related components, fuel assembly inserts, and instrumentation wires. It is typically managed alongside high-level radioactive waste due to the lack of a current disposal option, not because it is similar in nature to high-level radioactive waste. It contains the same radionuclides as other LLRW and therefore it is classified as LLRW. In fact, the majority of radionuclides that result in classification as GTCC decay away in a few hundreds of years which is much less than the life of a robust disposal facility.

GTCC can also be found in "sealed sources," which are solid materials that encapsulate a very small core of radioactive material. Common uses of sealed sources include being used in gauges and tools on daily basis in manufacturing facilities, petrochemical plants, medical and university research laboratories, and the oil and gas industry.

In a 1987 report to Congress, the DOE projected through the year 2020 that GTCC waste generated from sealed sources would remain relatively steady over time, while in the case of nuclear reactors, most GTCC waste will only be generated when the plants begin to be decommissioned.

In Texas, the NRC licenses for the two units at the Comanche Peak Nuclear Power Plant currently expire in 2030 and 2033, respectively. For the two units at the STP Nuclear Operating Company, those dates are 2047 and 2048. Unless the licenses are renewed and the plants continues to operate, they will be closed and decommissioned at that time.

How is GTCC Regulated?

National policy currently governing the ultimate disposal of GTCC LLRW ***remains exclusively in the purview of the federal government***. The disposal of GTCC is the responsibility of DOE and is governed by NRC rules adopted in 1989. Under those rules, GTCC must be disposed in a deep geologic repository *unless* the NRC approves an alternative on a case-by-case basis. There are currently no facilities in the United States authorized to accept GTCC for disposal. Any GTCC that has been generated is being stored at various facilities around the country, including some in Houston and San Antonio Texas, awaiting a disposal pathway.

National Policy is In Transition.

The NRC is currently working on a rulemaking to address the regulatory framework governing GTCC, with no anticipated date for final action.
In 2015, the TCEQ asked the NRC whether the State of Texas has authority to license the disposal of GTCC (among other radioactive waste streams) at the Waste Control Specialists (WCS) facility in Andrews County, Texas. This prompted NRC to undertake a review of federal requirements. Meanwhile, in 2016, the DOE concluded that the preferred disposal alternatives were the Waste Isolation Pilot Plant geologic depository near Carlsbad, New Mexico, and/or robust confinement in a commercial near-surface land disposal (i.e., disposal near the earth's surface, and in contrast to deep geologic disposal) facility elsewhere.

Then, in 2019, NRC issued what is called a "draft regulatory basis". It states that 80 percent of the

overall volume of GTCC could be suitable for near-surface land disposal, and that a facility for disposing of GTCC waste (approximately 95 percent) could be licensed at the State level (e.g., in Texas, by TCEQ). Such waste would need to be subject to additional controls to ensure protection to intruders and offsite individuals.

The NRC also found that for certain GTCC waste streams deeper below-surface disposal rather than near-surface land disposal would be necessary. Specifically, NRC identified sealed sources associated with waste generated at the West Valley Demonstration Project in New York (a spent nuclear fuel processor south of Buffalo). The NRC also identified regulations that currently provide for NRC-only licensing for 3 of the 17 waste streams due to the amount of special nuclear material that could be present in those wastes.

The NRC's Commission has subsequently directed the NRC staff to develop a rulemaking to address the regulatory framework governing GTCC disposal that would allow near-surface and intermediate depth disposal of GTCC and under State licensing, including an effort to see if the 3 waste streams identified above can be placed under State licensing. The date for final Commission action is not yet clearly defined. The Commission retains the authority to address proposals for GTCC disposal on a case-by-case basis. Future state policy development should be informed by any action(s) taken by the federal government.

What is ARDT?

Advocates for Responsible Disposal in Texas, or ARDT, represents the interests of LLRW generators. ARDT is supported by Texas' two nuclear power plants—Comanche Peak Nuclear Power Plant in Glen Rose, and the STP Nuclear Operating Company near Bay City—as well as by the health physics, medical, and university research communities. ARDT's overarching mission, consistent with the policy of the State of Texas, is to help LLRW generators ensure the safe and economical disposal of low-level radioactive waste and reduce regulatory uncertainty.

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Sources

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