Texas Compact Waste Facility Overview

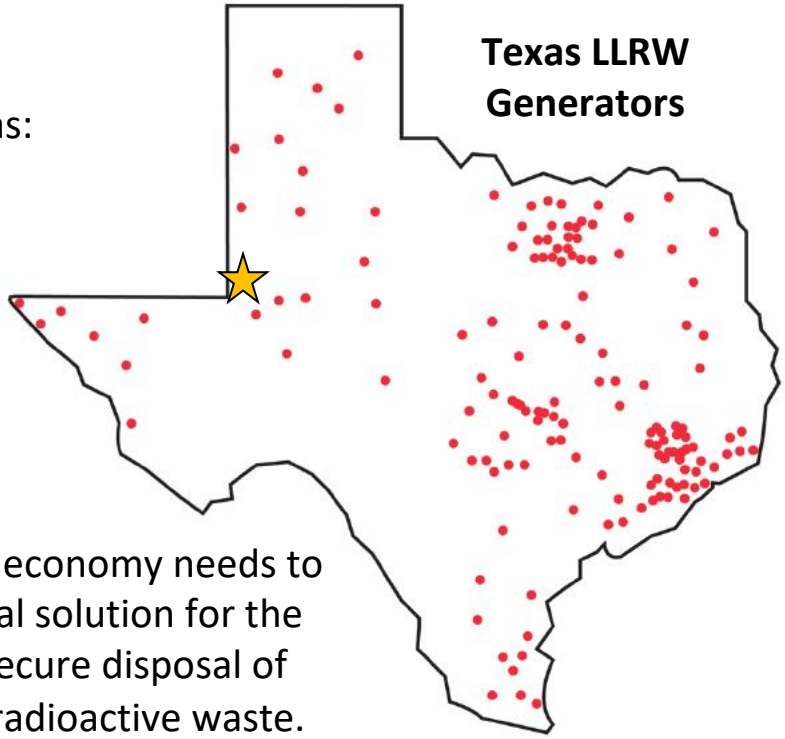
David Carlson
President and COO
Waste Control Specialists

Low-Level Radioactive Waste

Low-level radioactive waste (LLRW) is generated from everyday activities in crucial Texas industries. This waste is not suitable for disposal in traditional, less environmentally protected landfills due to its radioactivity.

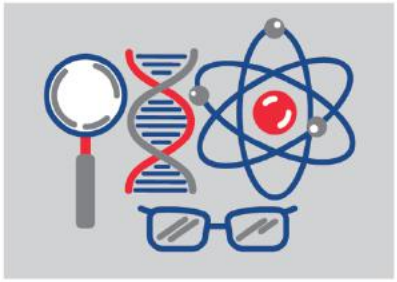
Texas waste generators include facilities such as:

- Hospitals
- Research Institutions
- Oil and Gas Operations
- Electric Utilities
- Military Bases



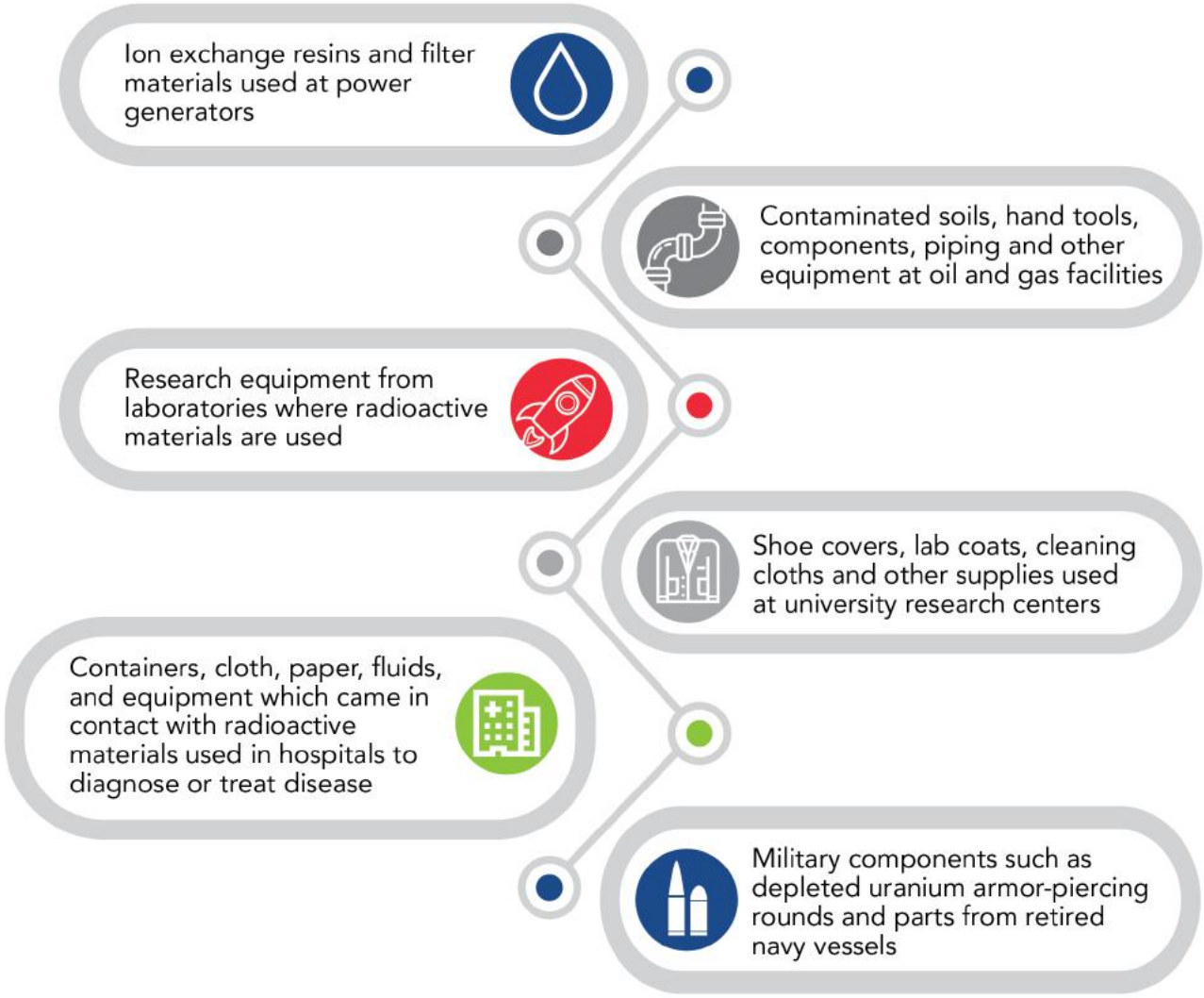
The Compact Facility in Andrews County is the disposal site for key components of our economy and way of life.

The Texas economy needs to have a local solution for the safe and secure disposal of low-level radioactive waste.



Low-Level Radioactive Waste

LLRW includes items that have become contaminated with radioactive material of have become radioactive through exposure to radiation. For example:



Compact Waste Facility

History

- Established for the Texas Compact under the Federal LLRW Policy Act of 1980
- Codified in Texas, Vermont, and Federal Law
- Construction was 100% privately funded
- Opened for LLRW disposal in 2012
- Texas owns the privately-developed Compact Waste Facility (CWF), it is operated by WCS

Key Statistics

- Located in western Andrews County
- 14,000 acre site - 1,400 acres used for waste operations
- 9,000,000 cubic feet of disposal capacity
- Approximately 2% of capacity used to date (in 9 years)

Community Support

- The Andrews community has supported the LLRW site since its start
- Andrews County voters approved a $75 million bond to support construction of the site (the bond has since been repaid)

Responsibility

- Site closure and long-term site monitoring is the financial responsibility of WCS and is provided by over $150 million in financial assurances
- If WCS as the facility license holder is not allowed to be competitive, Texas will still have the obligation to operate the site

Safety

Industrial Safety

- WCS is proud of our impeccable safety record
- We have gone 4 years without any Lost Time Accidents
- All potential incidents are investigated and addressed to ensure the highest safety standards

Radiation Safety

- Radiation exposure to our workers is less than they receive from natural radiation
- Radiation to the most exposed worker is less than 10% of the allowable limit
- Average radiation to workers is less than 1.5% of the allowable limit
- No radioactive releases from the site
- Radiation to off-site persons is zero

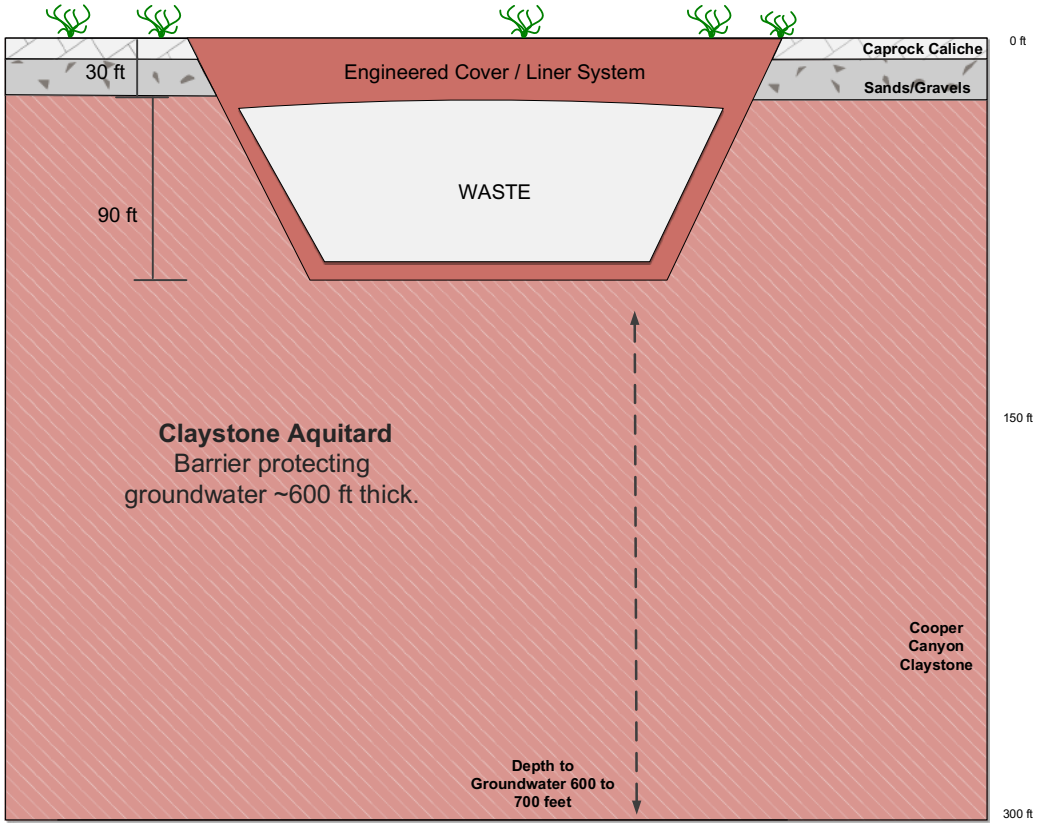
Environmental Monitoring

- Groundwater Monitoring Wells - 343 wells
- Air Monitoring Stations – 26 stations
- External radiation monitoring – 18 stations
- Soil, sedimentation and vegetation sampling

Oversight

- TCEQ/Texas review of reports on all aspects of safety and operations (294 required submittals and 26 required notifications)
- TCEQ has two on-site inspectors that monitor WCS and observe all CWF disposal

Environmental Protection - Robust Design



1) **Waste depth**
   - 30 to 120 feet below grade
   - Sub-grade design prevents erosion
2) **Liner**
   - geotechnical fabric, concrete, and clay
3) **Natural Claystone Barrier**
   - No long-term reliance on man-made materials
   - Less porous than concrete
   - Conductivity is 1-4 feet per 1000 years
4) **Groundwater**
   - 1st continuous groundwater is at 600 feet (Trujillo) and is non-potable, confined, not connected to any aquifer
   - 2nd continuous groundwater is 1400 feet (Santa Rosa) and is non-potable, confined, not connected to any aquifer
5) **Population**
   - Distant from local residents
   - Large site buffer areas
6) **Arid Climate**
   - Evapotranspiration exceeds infiltration

WCS is the Newest and Most Robust LLRW facility in the US

Environmental Protection - Geologic Stability

Deep Time

- The geologic formation has been stable for over 200 million years
- Future geologic stability will continue beyond tens of thousands of years

Seismic

- Extreme stability
- No known occurrence of post-Paleozoic faulting (260 million years)
- No quaternary faults within 100 miles (movement in the past 1.6 million years)

Water

- Originally covered by an inland sea – 270 million years ago
- Currently 3,400 feet above sea level
- Models predict site will remain dry (surface and subsurface) even if climate becomes wetter

Implications

- Stability beyond any reasonable timeframe

Performance Assessment

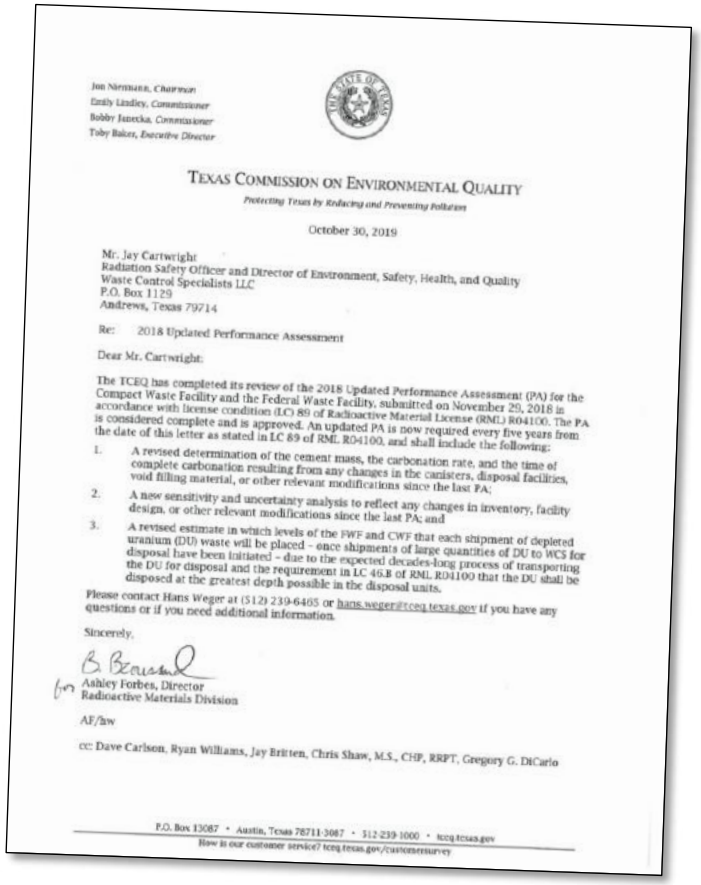
- The Performance Assessment (PA) is a based on detailed computer modeling and simulations of the site that include many critical parameters such as:
  - site geology
  - surface water and erosion
  - groundwater
  - potential future weather changes
  - possible future uses of the land
  - residential scenarios
  - intrusion scenarios

- The PA is based on scientific standards that are rigorously applied

- TCEQ requires performance evaluation out to one million years (other sites look at 10,000 years or less)

- The PA is reviewed and approved by TCEQ technical experts

- Current disposed inventory has an extremely low peak dose of 0.5 millirem per year to the most exposed individual



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Emily Lindley, *Commissioner*
Bobby Janecka, *Commissioner*
Toby Baker, *Executive Director*

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

October 30, 2019

Mr. Jay Cartwright
Radiation Safety Officer and Director of Environment, Safety, Health, and Quality
Waste Control Specialists LLC
P.O. Box 1129
Andrews, Texas 79714

Re: 2018 Updated Performance Assessment

Dear Mr. Cartwright:

The TCEQ has completed its review of the 2018 Updated Performance Assessment (PA) for the Compact Waste Facility and the Federal Waste Facility, submitted on November 29, 2018 in accordance with license condition (LC) 89 of Radioactive Material License (RML) R04100. The PA is considered complete and is approved. An updated PA is now required every five years from the date of this letter as stated in LC 89 of RML R04100, and shall include the following:

1. A revised determination of the cement mass, the carbonation rate, and the time of complete carbonation resulting from any changes in the canisters, disposal facilities, void filling material, or other relevant modifications since the last PA;
2. A new sensitivity and uncertainty analysis to reflect any changes in inventory, facility design, or other relevant modifications since the last PA; and
3. A revised estimate in which levels of the FWF and CWF that each shipment of depleted uranium (DU) waste will be placed – once shipments of large quantities of DU to WCS for disposal have been initiated – due to the expected decades-long process of transporting the DU for disposal and the requirement in LC 46.B of RML R04100 that the DU shall be disposed at the greatest depth possible in the disposal units.

Please contact Hans Weger at (512) 239-6465 or hans.weger@tceq.texas.gov if you have any questions or if you need additional information.

Sincerely,

for Ashley Forbes, Director
Radioactive Materials Division

AF/hw

cc: Dave Carlson, Ryan Williams, Jay Britten, Chris Shaw, M.S., CHP, RRPT, Gregory G. DiCarlo

P.O. Box 13087 • Austin, Texas 78711-3087 • 512-239-1000 • tceq.texas.gov
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LLRW Market Changes

- When originally envisioned, legislators assumed that the Texas Compact Waste Facility would have a monopoly on radioactive waste disposal and therefore should be economically and financially regulated similar to a regulated utility

- The management of radioactive waste disposal has changed significantly since the original Compact legislation was enacted:
  - improved waste minimization strategies
  - increased options for radioactive waste disposal at other facilities including hazardous waste disposal sites and municipal landfills

- Most of the revenue of the Texas Compact Waste Facility (about 90%) is provided by generators from outside the Texas compact

- For the Texas Compact Waste Facility to remain economically viable, updates to the economic and financial aspects of Texas legislation are required

- The Texas Compact Waste Facility remains a vital resource for Texas LLRW generators