

What makes Waste Control Specialists Unique?



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What Makes WCS Unique?

Protectiveness

- Geologic Stability
- Groundwater protection
- Design
- Performance Assessment

Capabilities

- Class A/B/C
- Exempt
- Bulk
- Transportation
- CISF (future)

Innovations

- Bag System
- Orano MP-197HB









Protectiveness – Geologic Stability

Deep Time

- ► Formation has been stable for over 200 million years
- Future geologic stability beyond tens of thousands of years

<u>Seismic</u>

- Extreme stability
- ► No known occurrence of post-Paleozoic faulting (260 million years)
- ▶ No quaternary faults within 100 miles (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

Red Bed Clay Ridge

- ► Layer is 1400 feet thick and impermeable
- ▶ Ridge rises to within a few feet of the surface, disposal facilities situated along ridge

Implications

Stability beyond any reasonable timeframe



Protectiveness - Groundwater

Depth to WCS Groundwater

- ► 1st continuous groundwater is at 600 feet (Trujillo)
 - Non-potable, confined, and not connected to any aquifer
- 2nd continuous groundwater is 1400 feet (Santa Rosa)
 - Non-potable, confined, and not connected to any aquifer
- Other sites
 - Clive = 18 to 35 feet
 - Barnwell = 30 to 50 feet

Permeability of WCS subsurface

- ▶ Hydraulic Conductivity is 1 to 2 orders magnitude lower than RCRA liner
- ► 1-4 feet per 1000 years
- ► Time from disposal cell to Trujillo = 500,000 years
- Other sites
 - Orders of magnitude more permeable

Implications

▶ No significant migration of mobile radionuclides H-3, C-14, Cl-36, Tc-99, I-129



Protectiveness - Design (vs. Generic Facility)



- 1) Sub-Grade Design
 - Erosion avoidance
- 2) Natural Claystone Barrier
 - No reliance on man-made materials
 - Less porous than concrete
- 3) Depth
 - 30-120 feet below grade

- 4) Population
 - Distant from residents, low population density
 - Large site buffer areas
- 5) Arid Climate
 - No leachate from closed cells
- 6) Liner
 - CWF natural clay, geotechnical, concrete
 - Exempt natural clay, double geotechnical (Subtitle C)

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

Protectiveness - Performance Assessment - 2018 Update

- PA examines site geology, surface water and groundwater, potential future weather changes, residential and intrusion scenarios, and possible future uses of the land
- Evaluated to one million years
- Current disposed inventory has a peak dose of 0.5 millirem per year at 170,000 years from closure

Modeling Conclusions (not in PA)

GTCC and DU - The DOE inventory of GTCC low level waste and DU combined would result in a peak dose of approximately 45 mrem/year at 1,000,000 years post closure.

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	Emily Lindley, Commissioner	(SPA) (S)	
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	oby Baker, Executive Director		
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	TEXAS CO	MMISSION ON ENVIRONMENTAL QUALITY	
	m	stecting Texas by Reducing and Preventing Pollution	
		October 30, 2019	
	Mr. Jay Cartwright		
	Waste Control Specialists LLC P.O. Box 1129	Director of Environment, Safety, Health, and Quality	
	Andrews, Texas 79714		
	Re: 2018 Updated Perform	ance Assessment	
	Dear Mr. Cartwright:		
	The TCEQ has completed its re Compact Waste Facility and the accordance with license condit is considered complete and is a the date of this letter as stated	view of the 2018 Updated Performance Assessment (PA) for the e Federal Waste Facility, submitted on November 29, 2018 in ion (LC) 89 of Radioactive Material License (RML) R04100. The PA approved. An updated PA is now required every five years from in LC 89 of RML R04100, and shall include the first order to the top of the LC 89 of RML R04100, and shall include the first order to the top of top of the top of the top of top of the top of top of the top of top of top of top of top of the top of top	
	 A revised determination complete carbonation re void filling material, or e 	a of the cement mass, the carbonation rate, and the time of esulting from any changes in the canisters, disposal facilities, other relevant modifications since the last PA.	
	 A new sensitivity and un design, or other relevant 	recertainty analysis to reflect any changes in inventory, facility	
	 A revised estimate in wh uranium (DU) waste will disposal have been initia the DU for disposal and disposed at the greatest of 	tich levels of the FWF and CWF that each shipment of depleted be placed – once shipments of large quantities of DU to WCS for ted – due to the expected decades-long process of transporting the requirement in LC 46.B of RML R04100 that the DU shall be depth possible in the disposal units	
	lease contact Hans Weger at (51 uestions or if you need additior	(2) 239-6465 or <u>hans.weger@tceq.texas.gov</u> if you have any nal information.	
	ncerely,		
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001	dioactive Materials Division		
	AF/hw		
	Dave Carlson, Ryan Williams, J	ay Britten, Chris Shaw, M.S., CHP, RRPT, Gregory G. DiCarlo	
	P.O. Box 13087		
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Capability - Compact Waste Facility

- The **ONLY** facility established under the LLRW Policy Act of 1980 Compact System
 - Established for the Texas Compact, per Federal, Texas, and Vermont Statutes
 - Opened for LLRW disposal in 2012
 - Open to all US States (with export and import approval)
- Key Statistics
 - 9,000,000 cubic feet of disposal capacity
 - TCEQ owns the privately developed CWF, operated by WCS
 - Adequate capacity for D&D of <u>ALL</u> US NPP
- License Term through September 2024 with provision for 10-year renewals thereafter
- Liability State of Texas review, acceptance, and ownership of waste
- Implications generator future liabilities are minimized



Compact Waste Facility (CWF)





Capability - Low Activity Radioactive Waste

Low Activity Waste (RCRA Subtitle C) Disposal Facility:

- 62,000,000 cubic feet of currently permitted capacity (and space for expansion)
- Currently used = 20,000,000 ft3 (30% of capacity)
- Efficient option for large-volume and low activity waste streams
- Similar environmental performance with adjacent LLRW disposal
- Highly cost-competitive with other alternatives
- Currently in use for both operational and decommissioning waste

More than **90%** of decommissioning waste qualifies for exemption



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Capability - Bulk Waste

- Straddle Carriers are used for transfer of bulk waste from gondola railcars to haul trucks
- Capability fully implemented at WCS in 2019
- Additional capability added in 2020
- ▶ Intermodal containers are also used at some sites







Capability – Additional Bulk Rail Offload



- ► 2nd rail offload structure
- Doubles rail offload throughput
- ► In service this month





Capability - Heavy Equipment / Large Components

WCS owns and operates high capacity material handling equipment that has been designed and built for safe and efficient operations

Large Components are disposed in the CWF or LAW landfills

- ► Jacking System 600 ton
- Goldhofer -240 ton
- Modified Stacker 57 ton
- ▶ Mobile Gantry Crane 150 ton









Capability - Transportation Casks

Type B Transportation Casks (3 units in service)

- The most updated casks in service
- 160 ft3, fits standard liners
- 5.1 inches lead equivalent (more than an 8-120)
- Up to 500 rem/hr
- ► Type A Transportation (2 units in service)
 - 215 ft3, fits standard liners
 - 2.7 inches lead equivalent







Capability - Rail Transportation

Direct Rail:

• Texas and New Mexico Railway (TXN) interchange to Union Pacific (UP) at Monahans

Transload to Truck:

- Lubbock and Western Railway (LBWR) interchange to BNSF at Lubbock
- Rail lines upgraded to support shipments over 450,000 lbs







Capability (Future) - Consolidated Interim Storage (CISF)

- Used nuclear fuel is uranium fuel rods that have been removed from a nuclear reactor
- Used nuclear fuel is stored in Texas and at more than 70 sites around the country
- Interim Storage Partners (ISP) has been formed by Orano USA and WCS



CISF Application

- Consolidated Interim Storage application submitted to NRC June 8, 2018
- ▶ NRC issued draft Environmental Impact Statement (EIS) on May 4, 2020
- ▶ NRC estimates completion of licensing by August 2021



Innovation - Collapsible Bag Resin Liner

- Revolutionary, patent pending collapsible bag liner
- ▶ Metal shell is reusable, bag and lid are disposed
- ► The collapsible bag attaches to the liner lid.
- The lid and bag are removed from the shell and placed inside the Modular Concrete Canister (MCC)
- ► The bag collapses, eliminating wasted space in the MCC
- Typical disposal cost savings is 10-20% (or more for partially filled liners)







Innovation - Orano TN MP-197HB – use for D&D

- Spent Fuel Cask
- Licensed for irradiated hardware
- ► 400 ft3 internal volume
- Replaces use of 60 ft3 casks (over 6.5x more volume)
- ► Rail transportable







Thank You

Consolidated Interim Storage Facility

> Byproduct Facility

Federal Facility Compact Facility

Low Activity Waste Landfill

Rail Offload

Treatment Facilities

