WCS

THE TEXAS SOLUTION

Southern States Energy Board Joint Meeting of the Radioactive Materials Transportation Committee and the Transuranic Waste Transportation Working Group

November 27, 2012

WCS Safety and Quality Focus

- WCS maintains strong, overarching commitment to safety and quality
- WCS worked almost 5 years without a lost time accident. Included over 1 million safe work hours.
- WCS promotes a safety culture consistent with best nuclear utilities:
  - Trust-based organization
  - Open communication free from concerns over reprisal
  - All workers have right *and obligation* to report safety and quality concerns
  - Management practices conservative decision-making

WCS Services

WCS provides the most comprehensive, full service, and complete Radioactive and Hazardous Waste Services in the Nation.

Disposal

- Low-level radioactive waste (LLRW)/Mixed LLRW (MLLRW)
- RCRA/TSCA/CERCLA Regulated Waste (Hazardous waste)
- Texas Exempt Waste
- Byproduct Material

Storage

- Radioactive Waste, incl. GTCC LLRW, Transuranic Waste, Sealed Sources, and Byproduct Material
- RCRA/TSCA Waste

Treatment/Processing

- Mixed LLRW (MLLW)
- RCRA/TSCA Waste
- Exemption to treat and store Special Nuclear Material (SNM) below certain concentration limits based on criticality – U.S. NRC in November 2001 – No limit on disposal.

Looking North – Wide View

Looking West – Close Up

Aerial Photo Taken January 2012

License & Operations Status

Radioactive Waste Disposal License

- LLRW and Mixed LLRW Disposal
  - **Final LLRW license received – September 2009**
  - **CWF - First LLW disposed – April 2012**
  - **FWF – Ready for operations – September 2012**
    - **FWF also has RCRA Permit and TSCA authorization, CERCLA authorization pending**
- Includes Federal and Compact Landfills
  - **DOE signed Agreement to take ownership of the Federal Landfill post-closure**
  - **TCEQ has taken ownership of Texas Compact Landfill and WCS leases it back for operations**

Licensed LLRW Disposal Capacity

- **TX Compact Waste Disposal Facility:**
  - 2,310,000 cubic feet and 3,890,000 curies
- **Federal Waste Disposal Facility:**
  - 26,000,000 cubic feet and 5,600,000 curies total
  - 8,100,000 cubic feet and 5,500,000 curies of containerized Class A, Class B, and Class C
- **License Term - 15-years with provision for 10-year renewals**

Disposal Facility Basics

- The Federal Waste Facility (FWF) is designed, licensed, and constructed exclusively for federal waste disposal
- The FWF is a physically separate facility from the Compact Waste Facility (CWF) – no comingling of federal and commercial waste
- Both the FWF and CWF are licensed by the Texas Commission on Environmental Quality (TCEQ)

Disposal Facility Basics (cont'd)

- **FWF Disposal Capacity - 26,000,000 cubic feet**
- **Accepts Class A, B, and C Low-Level Radioactive waste for disposal** (as defined in both 10 CFR 61.55 and 30 TAC 336.362 Tables 1 & 2)
- **Accepts Class A, B, and C Mixed LDR-compliant waste for disposal** (excludes F020, F021, F022, F023, F026 and F027; Dioxins & Furans)
- **Up to 100 nCi/g transuranic isotopes**
- **Disposal is just one aspect of WCS' comprehensive waste services, including storage, treatment, and processing**

Dewatering Alternative

- License amendment granted by the TCEQ provides an alternative process for addressing resin liner dewatering that includes:
  - Physical Stability as required by 10 CFR61
  - Capturing the water released internally due to resin degradation with super absorbents
  - Capturing the water potentially released externally due to resin degradation with mineral based absorbents lining the MCC
  - Void Space Elimination

Comparison of Designs

Barnwell Design

Clive Design

WCS Design

WCS Landfill Design

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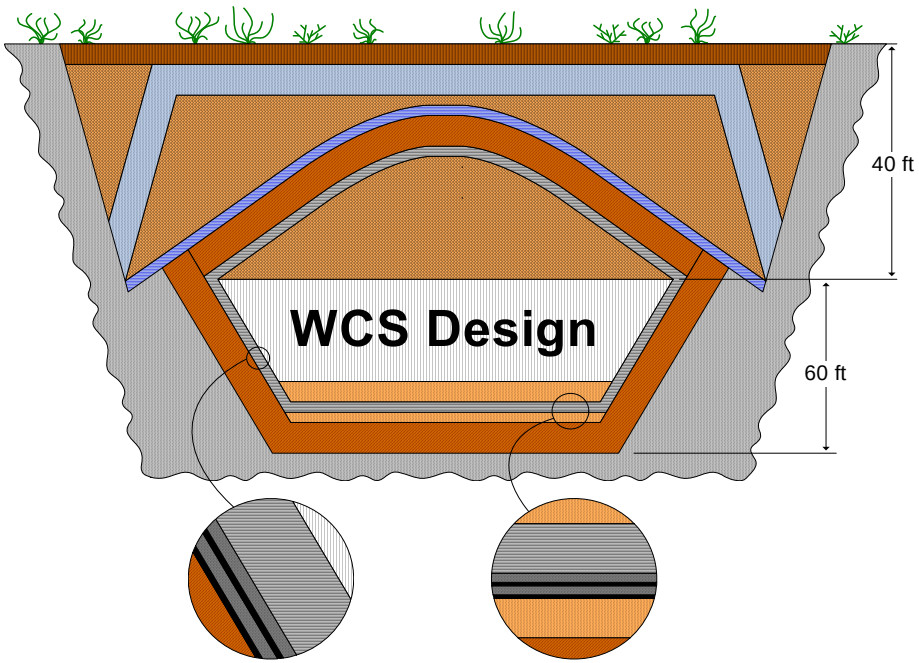
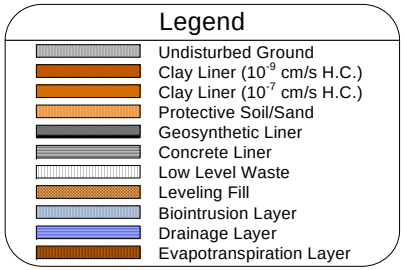
WCS Landfill Liner Design



- Multi-layered cover system that is 25 – 45 feet thick
- Depth to waste is at least 25 feet below surface
- Natural red bed clay is less permeable to water than concrete



WCS Compact Landfill – Native Clay

WCS Design – Near Completion

Federal Waste Facility

Modular Concrete Canisters (MCCs)

Cylindrical MCC

MCC Opened for Waste Placement

Rectangular MCC

The WCS Advantage

WCS Delivers on Stakeholder Expectations for 21st Century RadWaste Disposal

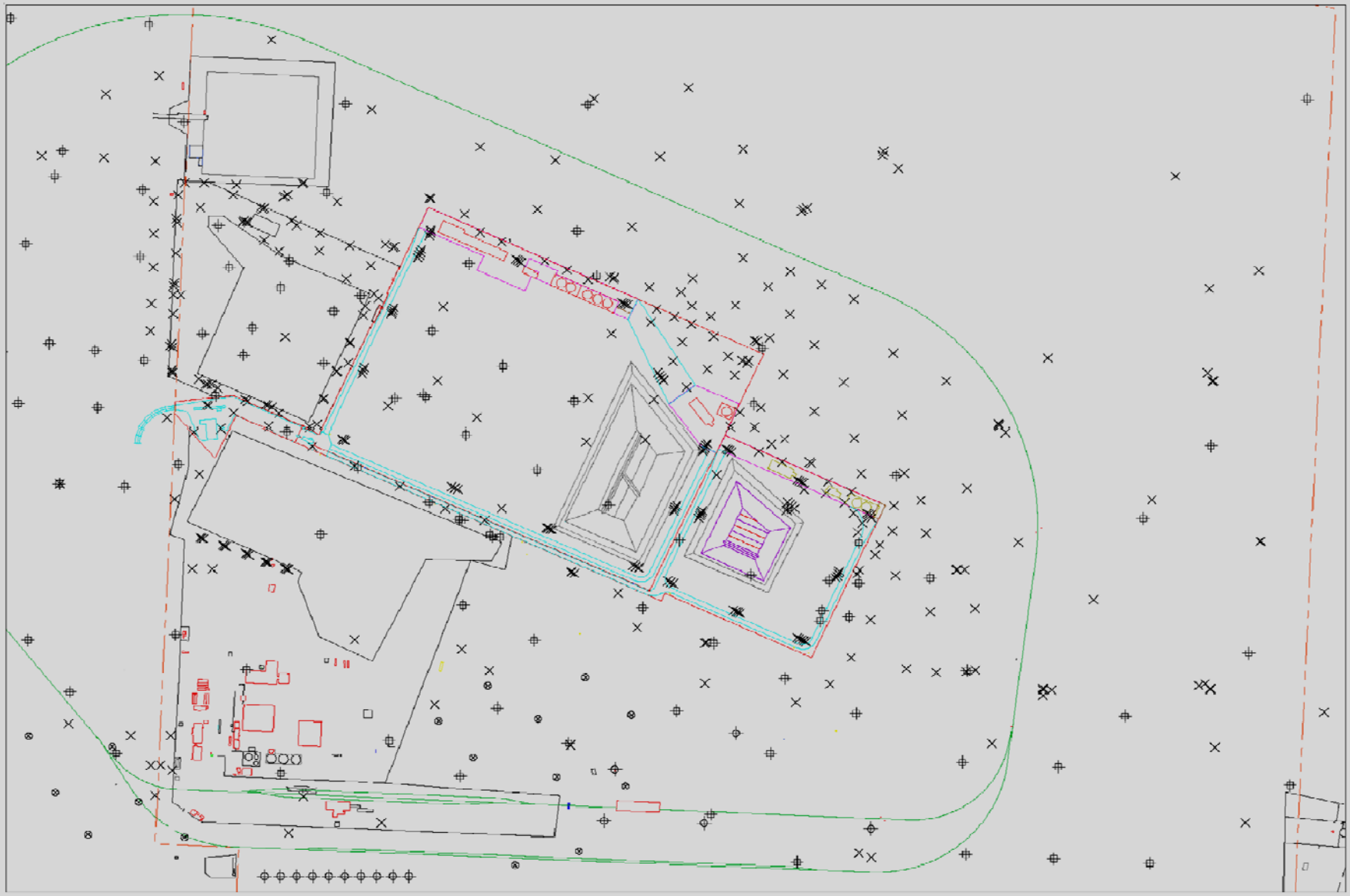
WCS State of the Art		Conventional Methods	
Reinforced Concrete Disposal Cell	✓	Burial Trench	NO
40-foot thick Multi-Layer Cover and Concrete Cap	✓	Soil Cover with a Pond Liner and Sandbags	NO
Remote Disposal in an Engineered Repository in an Arid Climate with no Potable Water Table	✓	Onsite/Local Disposal Near Their Water Table	NO
Best Available Technology	✓	Standard Disposal Methods at the Generator Site	NO

Site Characteristics and Design of LLW Landfill

Groundwater Monitoring

- Over 640 borings to determine geologic characteristics and confirm WCS is not over an aquifer
- Approximately 520 monitoring wells that are measured monthly, many of which are dry
- Over 260 monitoring wells are laboratory sampled on a quarterly basis, if there is enough water
- WCS installed 160+ borings by December 31, 2007, and that grew to over 640 borings today

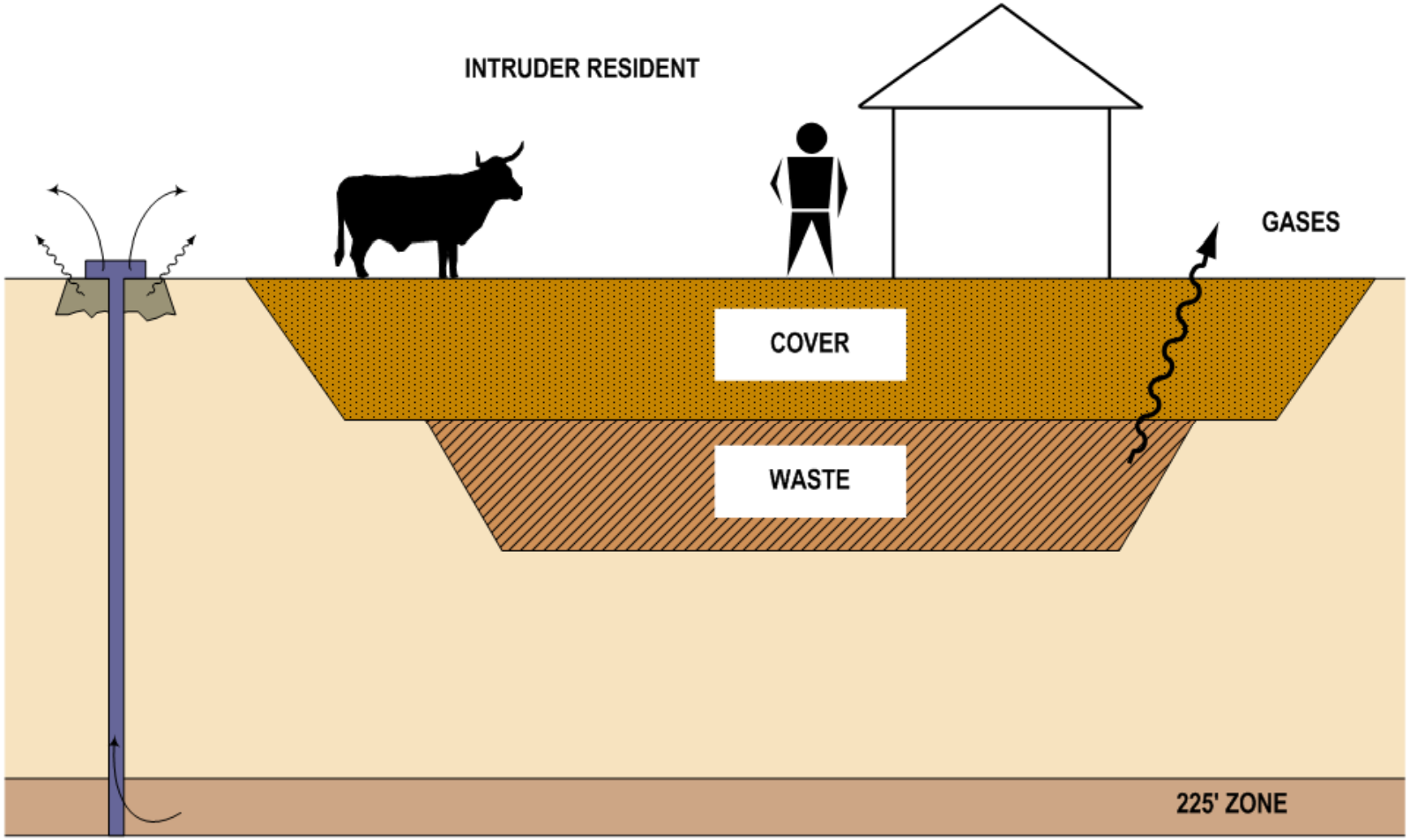
Map of Borings/Wells



Groundwater Characteristics

- WCS is not above or adjacent to any underground drinking water supply
- Texas State Water Development Board map confirms site characteristics
- Hydraulic conductivity of clay is $1x10^{-9}$ cm/sec and the 225-foot zone is $1x10^{-8}$ cm/sec
- Horizontal groundwater travel is 4 feet (1.3 meters) per 1,000 years
- Groundwater is ~16,000 years old

Dose Modeling for Intruder Resident



Peak dose less than 10 mrem/yr at 36,000 years. Regulatory limit is 25 mrem/yr.

WCS Operations

8-120B Cask offloads included liners with dose rates up to 330 R/hr

Grappler Attachment Unloading Cask

Remote Grout Placement

Pumping Grout into an MCC

Placement of Full MCC into CWF

Transfers and Grouting

Irradiated Hardware Transfer System

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CWF Disposal Operations

CWF Disposal Operations

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Transportation

Transportation

- Waste generators are responsible for compliant packaging and transportation
- Texas approves transporter qualifications
- All radioactive material received at WCS for treatment or disposal is manifested as Class A, B, or C waste
- WCS receives *packaged* waste by truck or rail

WCS Type-B Cask Services

- Contents: Resins & Filters
- Internal Volume: 160 ft^3
- Shielding Limit: 500 R/Hr
- Capacity: 10 (55) gallon Drums
- Max Payload: 15,000 lbs
- SAR submitted 10/9/12
- 2 available in early 2013

Summary

WCS Performance

- A robust and superior disposal cell design dedicated to federally generated waste (no risk of comingling)
- A single destination, rail served, for wastes providing a comprehensive array of processing, treatment and disposal services
- Expert technical support to develop waste management strategies, and to facilitate waste characterization, profiling, and disposal

Waste Acceptance – How do I get there?

- ✓ Contract executed
- ✓ Generator certification complete
- ✓ Waste profile and importation submittal
- ✓ Waste profile and importation approval
- ✓ Shipment request submittal
- ✓ Shipment approval

Questions?

www.texassolution.com