LLRW Clive Disposal Update

Presented by

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for

2015 Waste Management Symposia
Phoenix, AZ

March 16, 2015

Clive Disposal Facility

ENERGYSOLUTIONS

World's Largest

Commercial Radioactive Waste Disposal Facility

Our Values

ENERGYSOLUTIONS

- We always put Safety first
- We build Trust by
  - always telling the truth
  - making our Customer's success our success
  - being the best in the World at what we do
  - and delivering results
- We care deeply about our Employees and want them to be happy and successful
- We listen to our Internal and External Stakeholders and Partners

Safety

Clive

- Safety culture initiative (HPI)
- Last lost time injury November 2010
  - Currently at >1,100,000 hours without lost time injury
- Safety – avg <1 recordable in the past 3 years
- ALARA – avg annual dose 20 mrem/Radworker
- 2014 UMA Award of Excellence for Safety
- 2014, 2013, 2012, 2011, and 2010 NSC Award for Safety

Proven Experience

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- Over 27 years of proven experience treating and disposing of radioactive waste
- One-of-a-kind bulk waste and containerized waste facilities with unique licenses and permits
  - Radioactive Material Licenses (LLRW & 11e(2))
  - RCRA Permit (Treatment & disposal of MW)
  - TSCA Permit (PCB waste streams)
  - SNM Exemption (Concentration based limits)
- Over 11 miles of onsite rail for efficient and cost-effective waste handling
- Long-term federal and commercial contracts

Logistics, Processing, & Disposal

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Logistics

Provide all aspects of complex planning and transportation

Dedicated fleet of tractors, trailers, railcars, and containers

Processing

Own/operate multiple processing facilities in Canada, South Carolina, Utah, and Tennessee

The most diverse capabilities in the U.S. for handling, treating, and processing radioactive materials

Disposal

Own the largest commercial radioactive waste disposal facility for Class A low-level radioactive waste (LLRW) in the U.S.

Operate the LLRW disposal facility in Barnwell, SC to dispose of Class A, B, and C LLRW from Atlantic Compact states

Treatment & Disposal Services

- Bulk Waste Disposal
- Containerized Waste Facility
- Large Components
- Mixed Waste Treatment
  - Macroencapsulation
  - Stabilization
  - Liquid Solidification (LLRW and MW)
  - Mercury amalgamation
  - Thermal Desorption
- Disposal of PCB waste
- We have expanded our capabilities based on the customer's needs

Large Components

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Large Components

Clive Capacity

- Over 130 million cubic feet of licensed capacity remaining
- At average receipts of 3-4 million cubic feet per year, the Clive facility has 30 to 40 years of capacity remaining

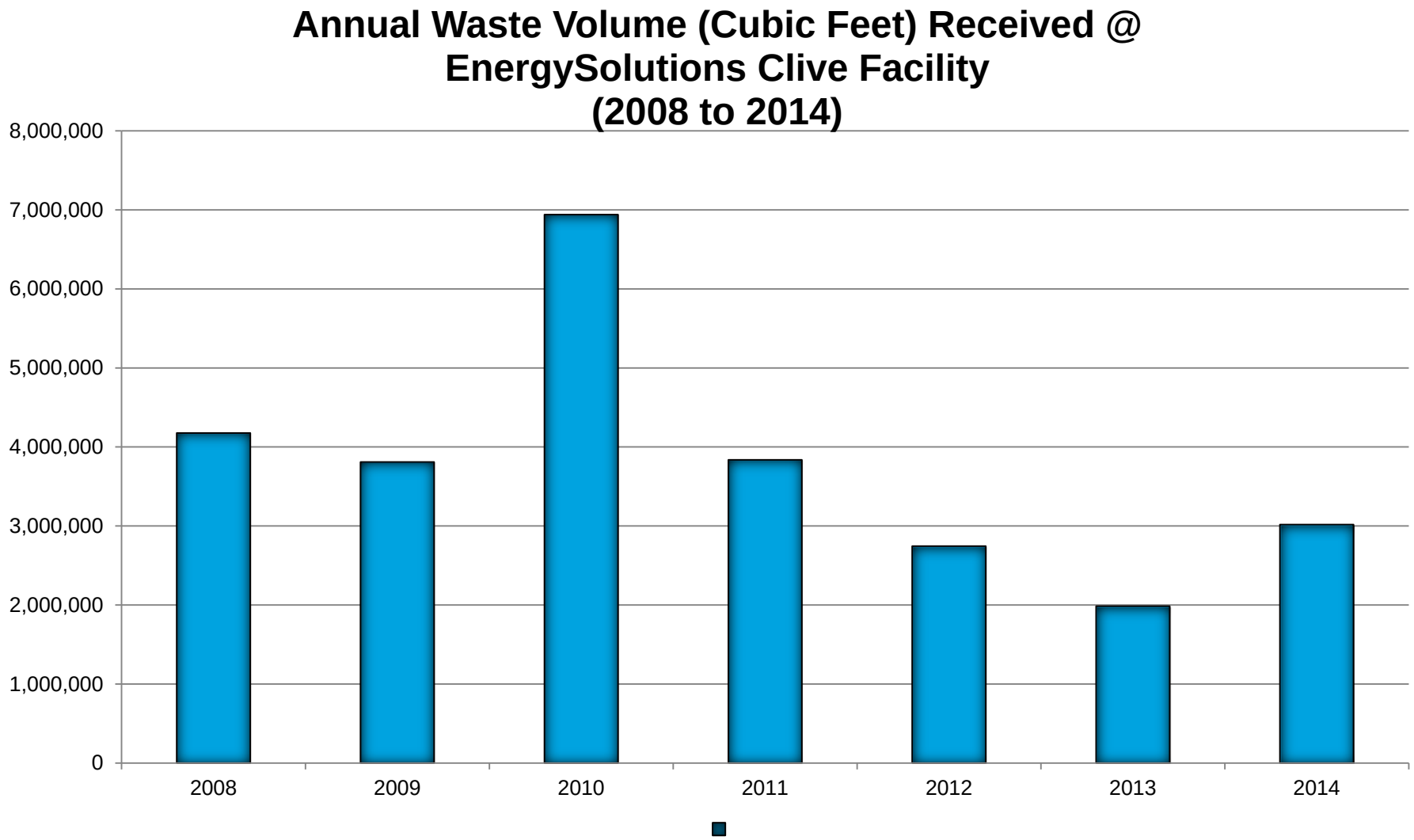
Sealed Sources

- Utah DRC approved License variance to dispose Class A sealed sources at Clive
- Allows disposal of certain Class A sealed sources
- Permanent License amendment has been requested and is part of the renewal
- DRC approval letter found at http://www.radiationcontrol.utah.gov/EnSolutions/docs/2012/Apr/Variance.PDF

Sealed Source Variance Conditions

- Variance Conditions
  1. Waste Class is calculated based on the activity and volume of each individual sealed source (activity cannot be averaged over the container for Waste Class calculation)
  2. Sources will be domestic only; and part of round-up coordinated by CRCPD SCATR program (Sealed sources must be registered at http://osrp.lanl.gov)
  3. A minimum of one inch of grout must encapsulate the sealed sources within the disposal container
  4. Disposed at Clive CWF (refer to the CWF WAC)
  5. EnergySolutions will approve each shipment
  6. Isotopes with half-lives of ~30 years or less (includes Cs-137)

Clive Disposal Volumes



Depleted Uranium Status

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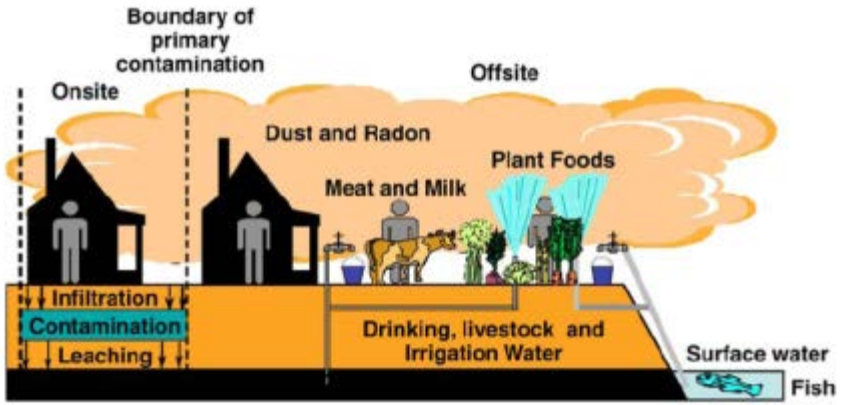
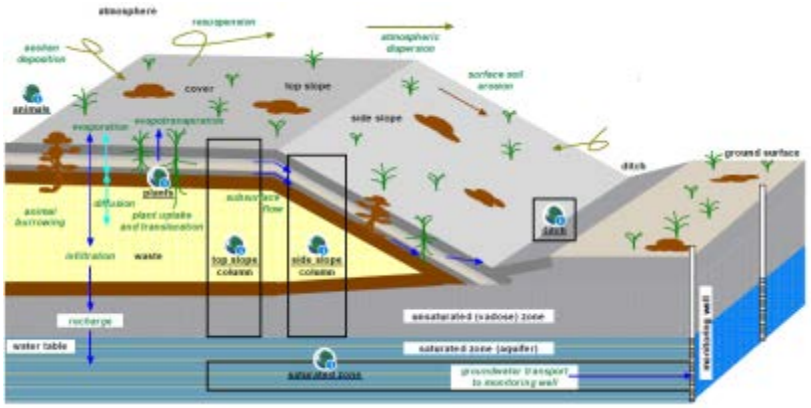
- Moratorium effective June 1, 2010
- May not receive or dispose of significant quantities of concentrated DU until PA approved
- PA submitted June 1, 2011
- Regulatory review underway
- Decision projected for Q2-Q3 2015



From NUREG/CR-6937, Fig. 1.1



Attribution Letter

- March 22, 2012, letter from Rusty Lundberg to Generator Site Access Permit Holders (GSAP)
- GSAPs may provide the original generator's name and original state of generation on the manifest
- GSAPs may also provide this information on a separate spreadsheet in cases where waste is attributed to the processor. A note shall be provided on the original manifest stating that additional information has been provided via spreadsheet.
- This will enable the DRC to confirm the origin of waste disposed of at the Clive facility.

GSAP rulemaking

- **HB-78 Passed the Utah Legislature**
- **19-3-106.4. Generator site access permits.**
  (1) A generator or broker may not transfer radioactive waste to a commercial radioactive waste treatment or disposal facility in the state without first obtaining a generator site access permit from the director.
  (2) The director may grant a generator site access permit to a generator or broker if:

    a. the Nuclear Regulatory Commission or the agreement state where the generator's or broker's facility is located has the jurisdiction to regulate the generator's or broker's handling, packaging, or transporting of radioactive materials; or

    b. the generator or broker agrees to grant the division reasonable access to its facilities for the inspection and verification of radioactive waste using Nuclear Regulatory Commission approved accountability guidelines.
- Basically, the state will no longer be inspecting facilities if they have a license under the NRC or Agreement state programs.

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Barnwell LLRW Disposal Site

March, 2015

2015 Waste Management Symposia
Phoenix, AZ

Compliance

- 44 Years of Uninterrupted Operations
- Energy*Solutions* Operation Assessments/Observations
  - Internal Assessments
  - External Assessments
  - Independent Assessments
  - Management Field Observations
- DHEC Licensing and Oversight
  - Extensive license conditions
  - Inspections
  - On-site inspector
    - Daily shipment inspections
  - Engineers
    - Weekly site inspections
  - Staff
    - Unannounced semi-annual license inspections
      - 2014 – 2 inspections – 0 NOV's

BDF

- 235 Acres Owned by the State of South Carolina
  - Energy*Solutions* leases the facility from South Carolina Budget and Control Board
  - Energy*Solutions* operates the disposal facility under SC DHEC Radioactive Material License 097
- Atlantic Compact member
  - Acceptance of Class A/B/C waste shipments 7 days per week
  - Acceptance of large components and irradiated hardware shipments
- Institutional Activities
  - Site maintenance
  - Environmental monitoring

Class A/B/C Waste Disposal

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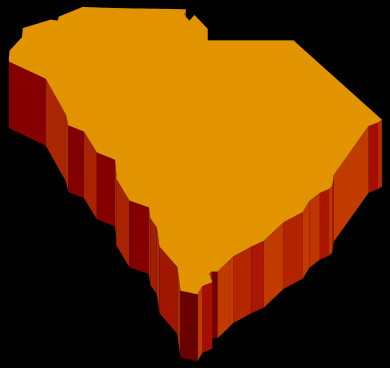
Atlantic Compact Host Site



South Carolina

New Jersey

Connecticut

Barnwell Complex

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BDF

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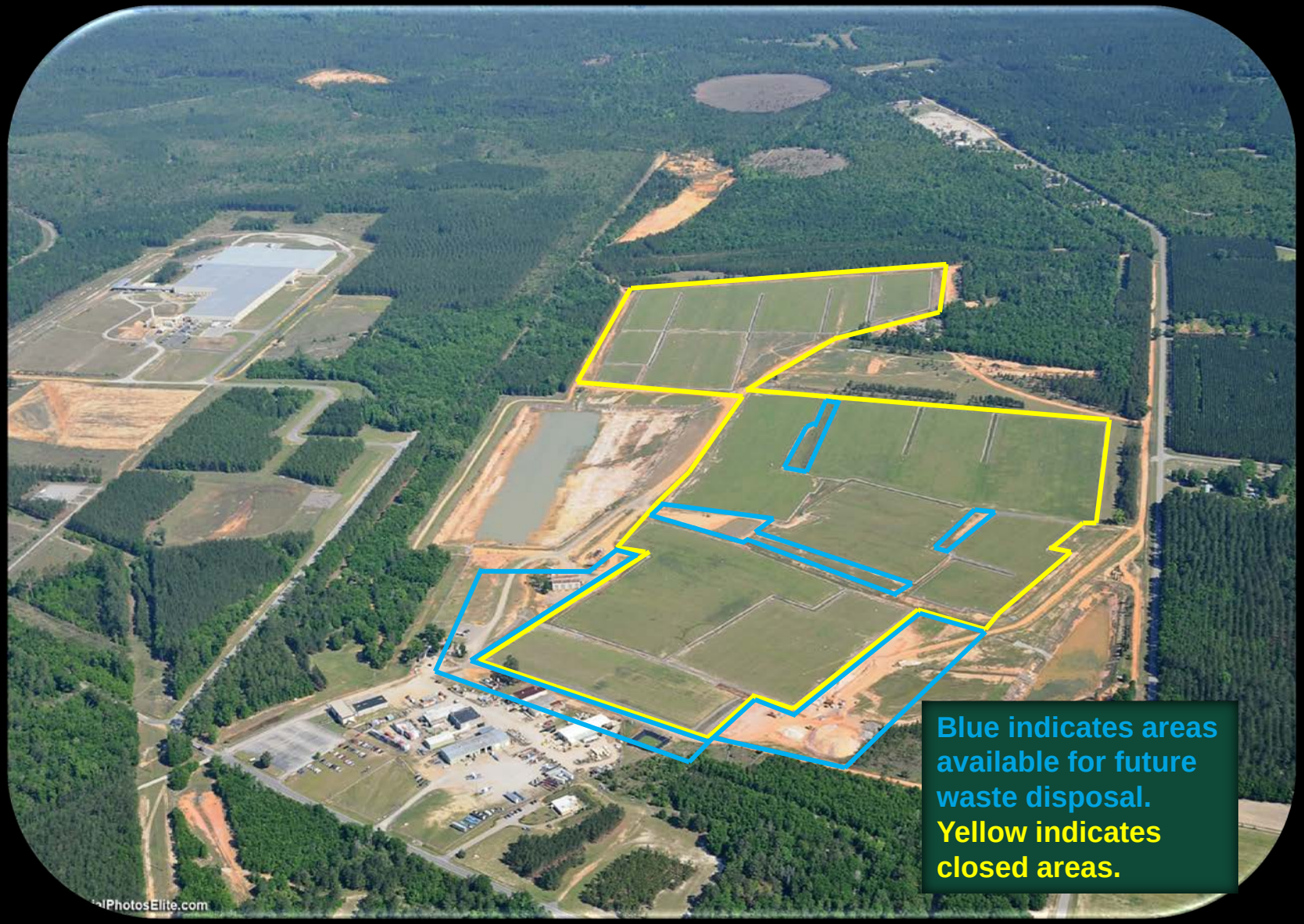
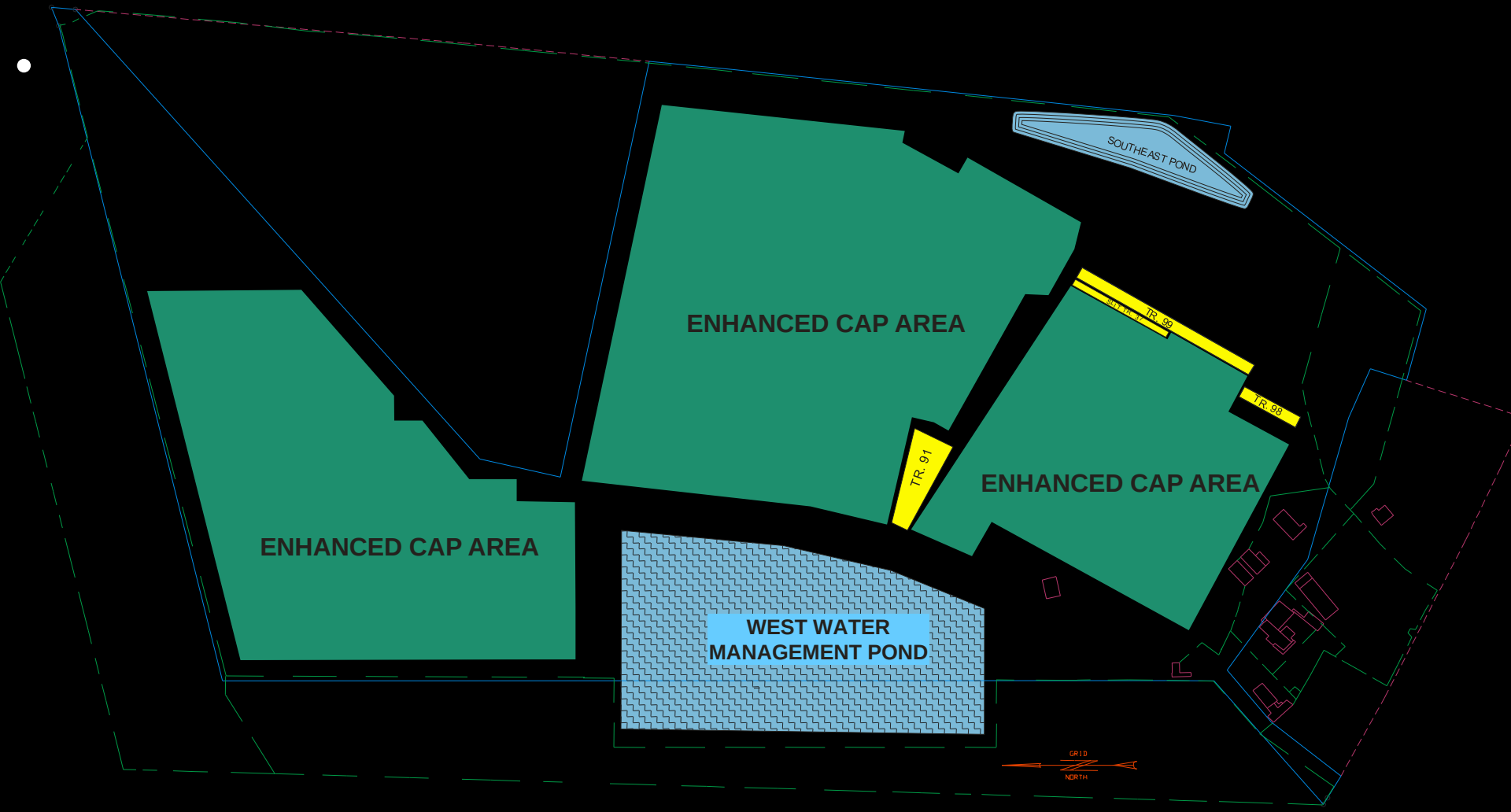


BDF Configuration



Not to Scale

Enhanced Cap

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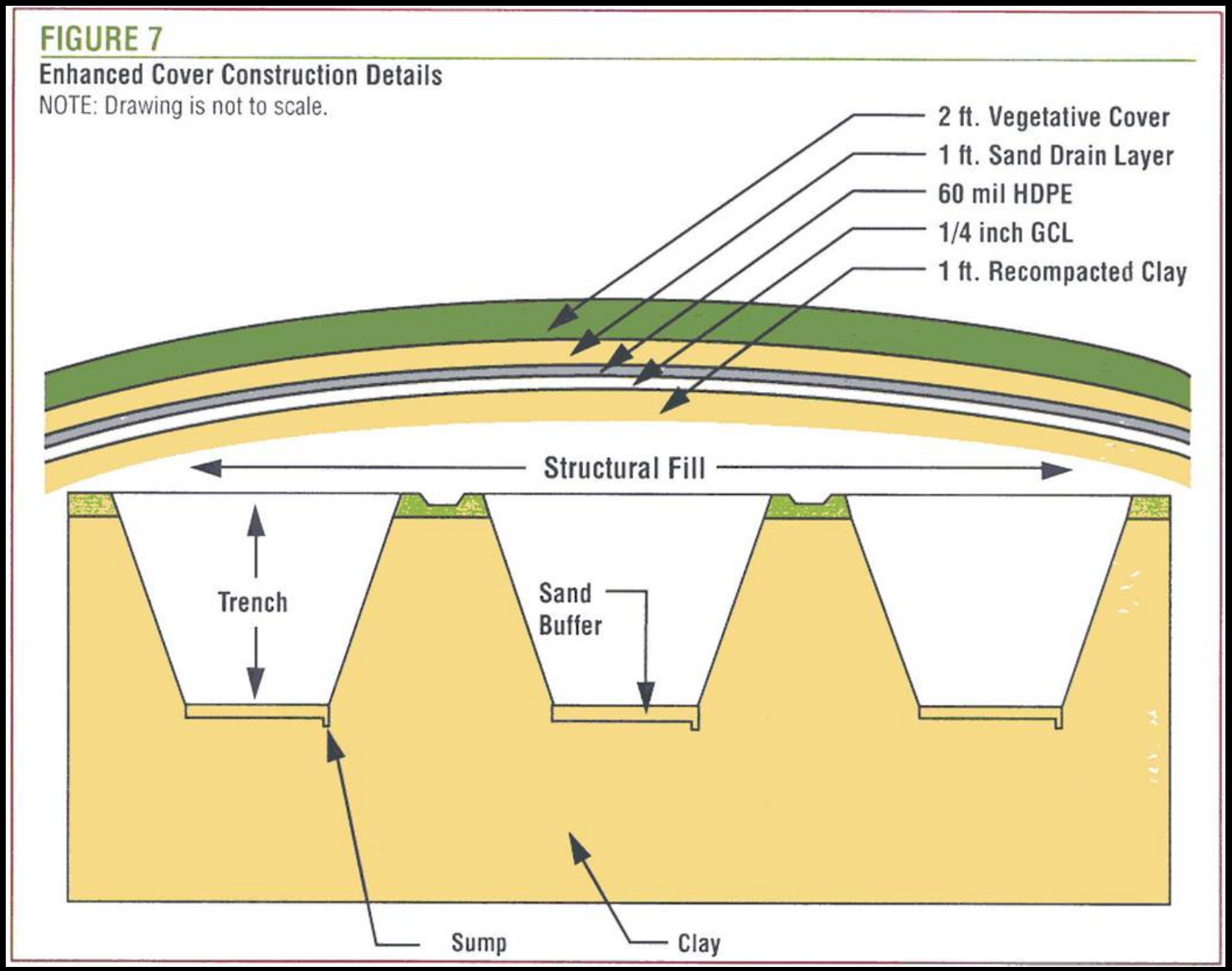


BDF Class A/B/C Disposal Trench

- All waste classes in same trench
  - Separate vaults for stable/unstable
- All waste in DHEC-approved vaults

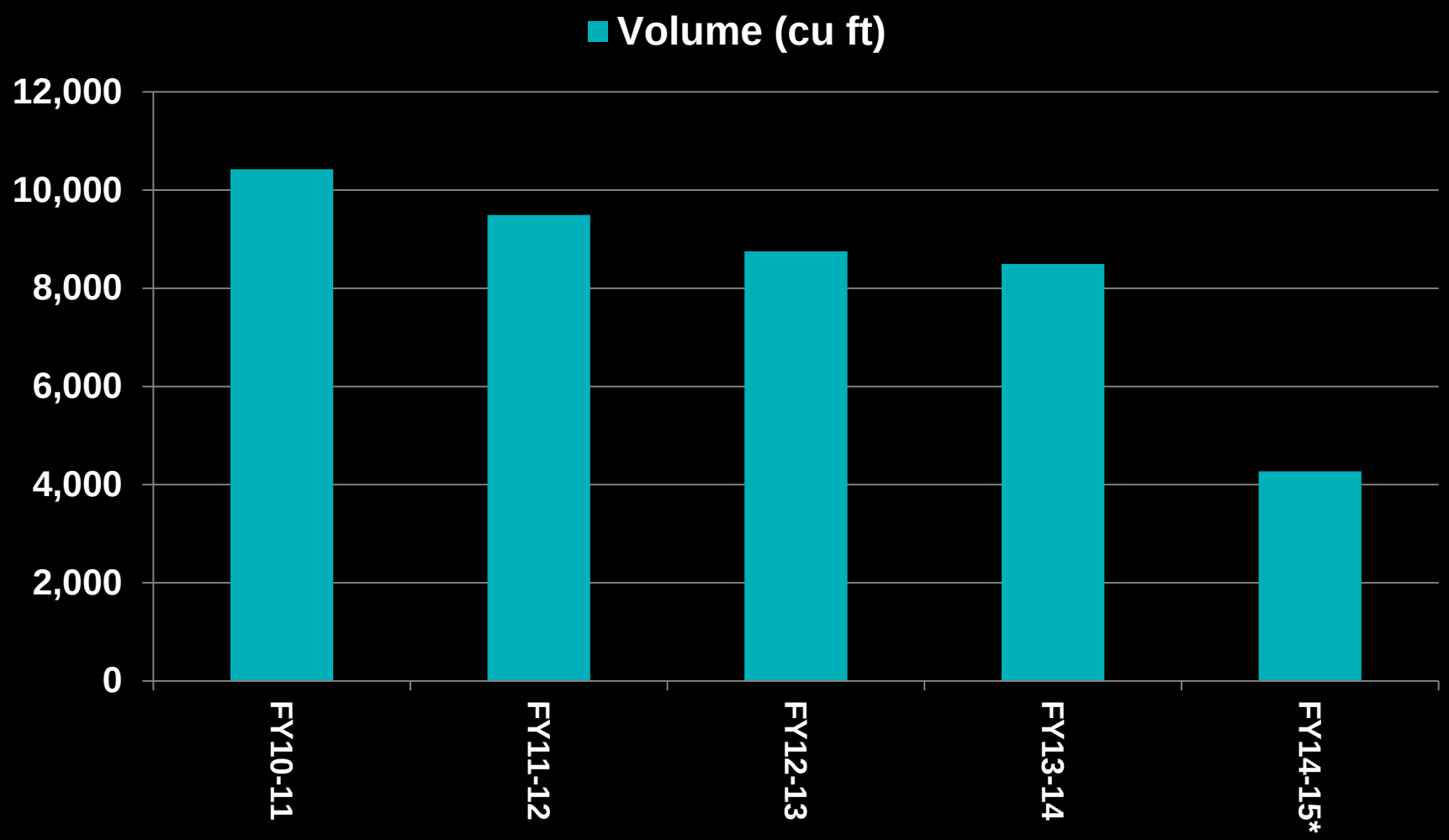
Class A/B/C Waste Disposal

- All waste arrives by truck
- Most shipments are HIC liners
- Vertical crane lift to place liner in prepositioned vault

Irradiated Hardware & Large Component Shipments

- Pricing based on case-by case basis
- Generators are encouraged to coordinate shipments

Recent Annual Waste Volumes Received (Fiscal Years)



- * as of February 2015

Recent Waste Volumes

Waste Type	FY 11/12 ft^3	FY 12/13 ft^3	FY 13/14 ft^3	*FY 14/15 ft^3
Routine Utility Waste	9,201.0	8,582.0	8,366.0	4,268.2
Non-Utility Waste	119.947	171.036	12.699	2.740
Large Components	0	0	0	0
Irradiated Hardware	173.4	0	115.0	0
Total Received	9,494.347	8,753.036	8,493.699	4,270.94

* As of February 2015

Atlantic Compact Disposal Rates

- Alternative Rate Schedule for FY 2014/2015 approved by SC B&CB.
- Individual reactors may elect Option B Access Fee pricing
- Interim revenue requirement for Option B participants for 7,000 cubic feet: $4,561,000
  - Each Option B participant allocated an equal share of the volume and equal quarterly access fee
  - Differential to projected cost requirement of $5,309,444 made up from budget proviso funds
- Other generators use Maximum Uniform Rate Schedule

Utility Agreements for FY 2011/2012

- All 5 Utilities with 13 Reactors chose Option B pricing
- Quarterly access fee: $87,711.54 per reactor
- Annual volume allocation: 538.46 cubic feet per reactor
- Additional volume: $133 per cubic foot (11,500 cubic feet maximum total volume)
- Utilities can share annual volume allocation with appropriate contract changes

Maximum Uniform Rate Schedule

- Permanent ceiling on disposal rates applicable to Atlantic Compact waste
  - Adjusted each year in accordance with PPI
- Pricing based on several factors including:
  - Density and weight
  - Dose rate
  - Radioactivity
  - Biological waste
  - Other charges (Irradiated hardware, SNM, Atlantic Compact Commission)

Closure Performance Objectives

- Phase I Closure Performance Objective Plan
- License 097, Condition 98, 16 performance objectives
- License 097, Condition 99, requires closure plan and adequate financial assurance
- Ensure compliance with closure performance objectives

Phase 1 Closure Completed June 2013

Barnwell Environmental & Dosimetry Lab

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- Environmental Monitoring
- Radiological Laboratory
- Radiation Dosimetry
- Engineering Support
- Site Characterization
- Hazardous Material Management


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