

ENERGYSOLUTIONS

Decommissioning QA Overview



Proven Progress • Proven Processes • Proven People
World Class Performance

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EnergySolutions - Overview



EnergySolutions is a nuclear services company headquartered in Salt Lake City, Utah. With more than 200+ years of operational waste management and decontamination & decommissioning experience, EnergySolutions has the more comprehensive skilled, motivated and well trained global workforce who are committed and focused on safety, quality and continuous improvement.



Two Major Divisions:

➤ Operational Waste Management

- ☐ Containers & Casks
- ☐ Logistics & Transportation
- ☐ Facilities

➤ Decommissioning

- ☐ Decommissioning Projects Group
- ☐ Major Projects

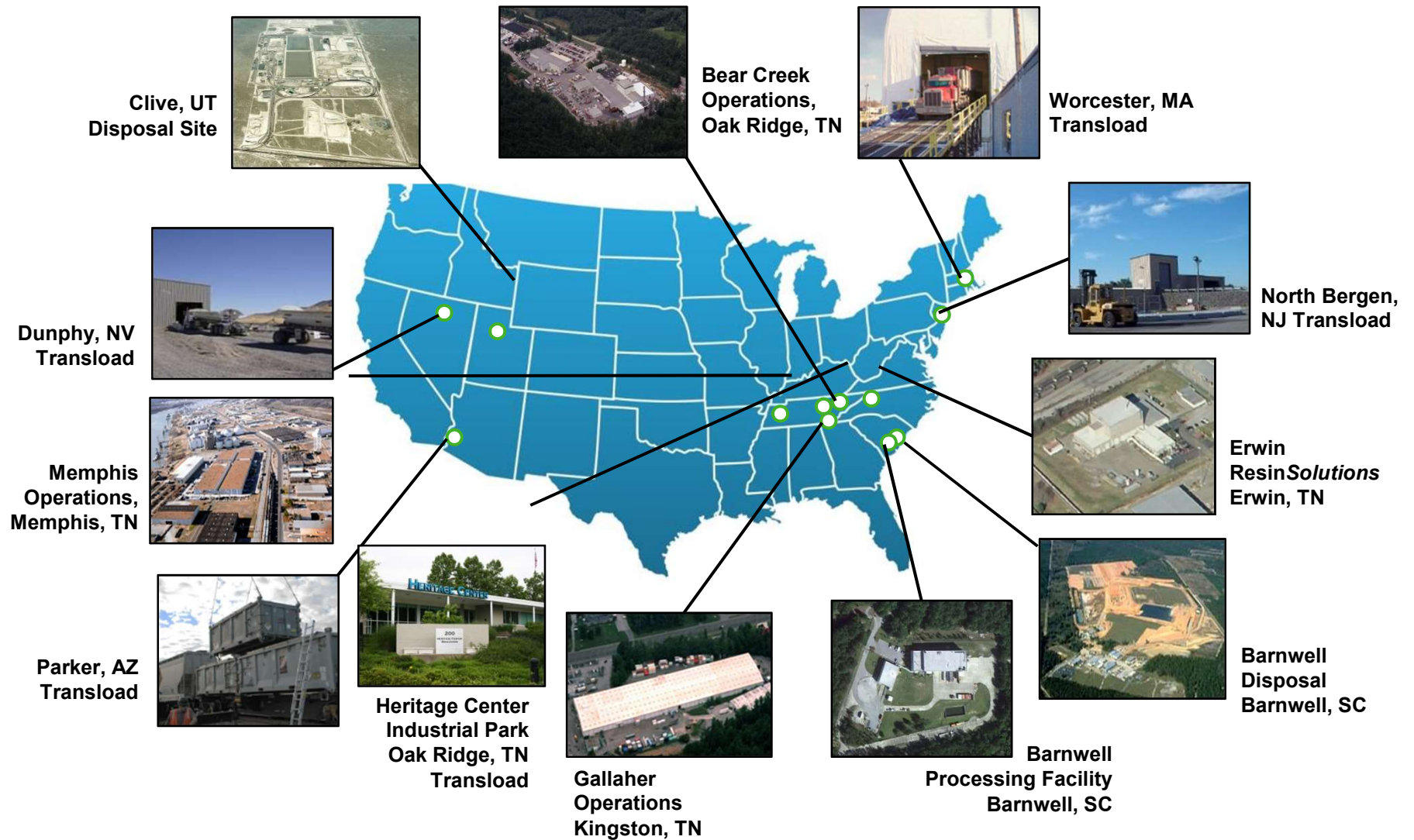
ITS Activities:

- Consolidated to Barnwell, SC

ES Acquisition History



Waste Operations



Integrated Capabilities & Assets

Process & Disposal Facilities

- Clive
- Bear Creek

Containers & Casks

- Railcars
- Specialty Containers
- Licensed Casks

Logistics & Transportation

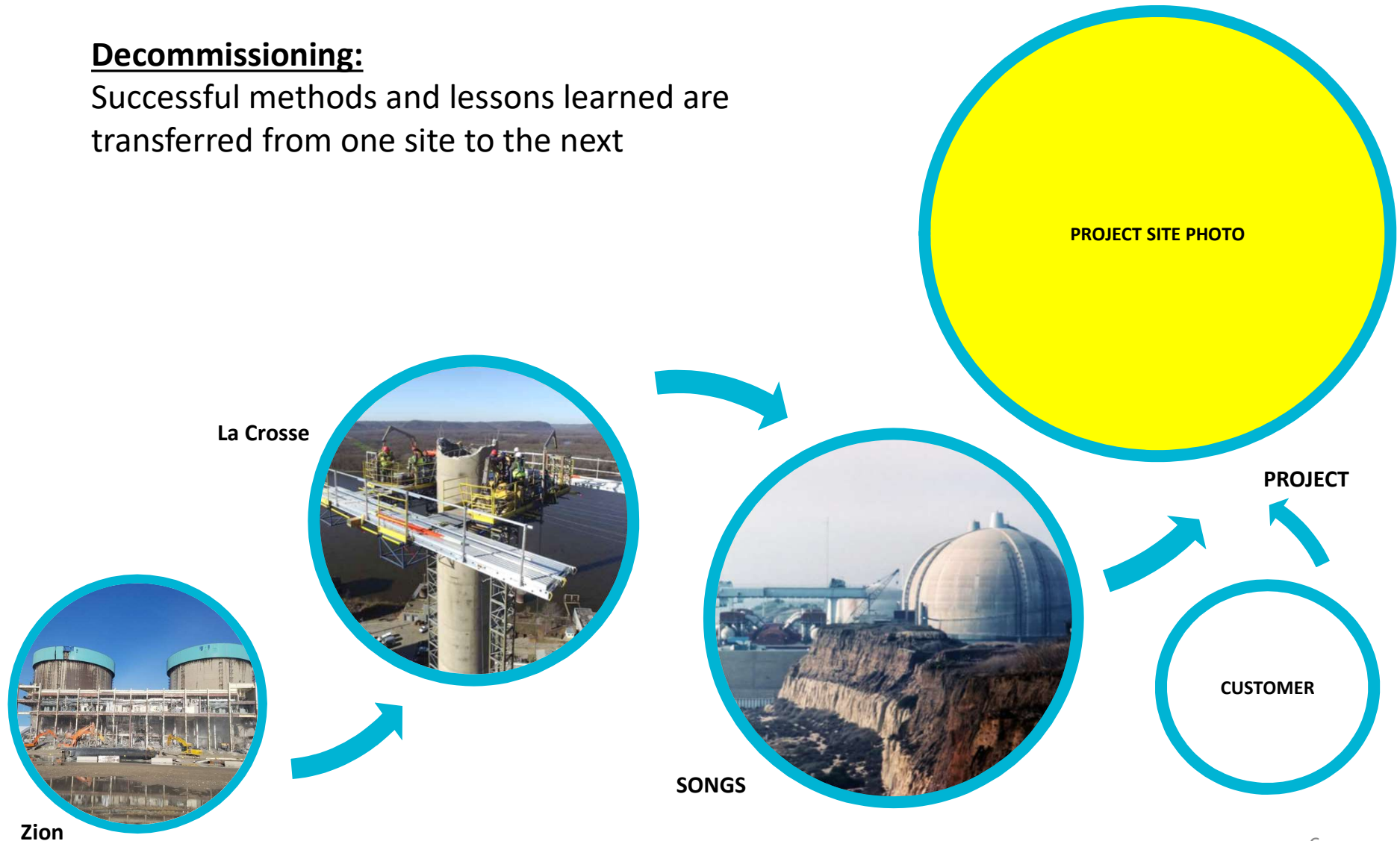
- MHF
- Hittman



Knowledge & Lessons Learned

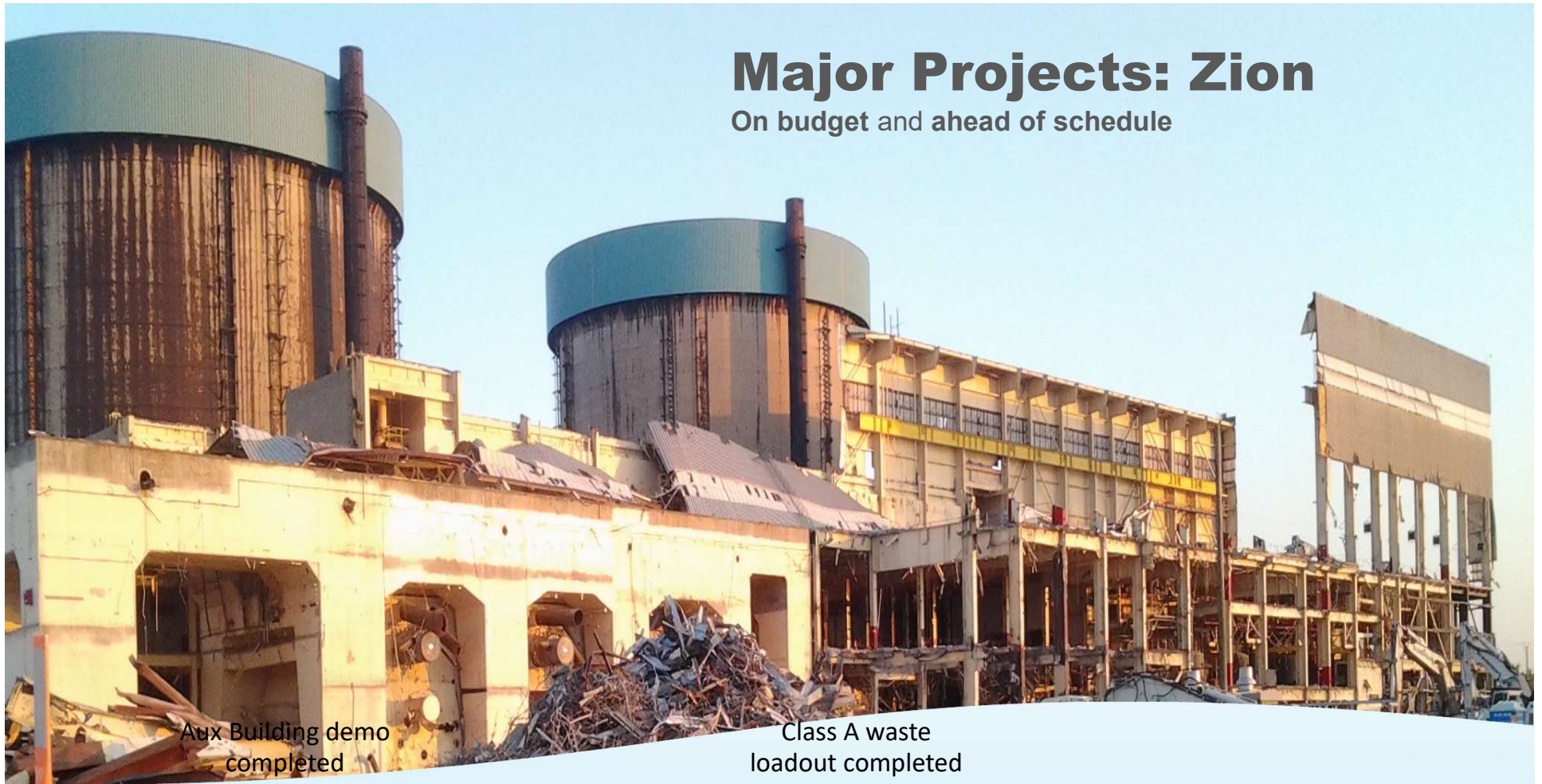
Decommissioning:

Successful methods and lessons learned are transferred from one site to the next



Major Projects: Zion

On budget and ahead of schedule



Aux Building demo
completed

April 2018

Class A waste
loadout completed

October 2018

Open air
Containment demo
completed

November 2018

Estimated NRC
approval for license
termination

2019

Major Projects: La Crosse

On budget and ahead of schedule

License Termination Plan approved



Reactor Building demo completed



FSS underway



NRC approval for license termination
expected 2019



Property will be turned back over to
Dairyland





Major Projects: SEFOR

Southwest Experimental Fast Oxide Reactor

**On budget and less than half
DOE cost estimate**

Phase 1

- Decommissioning Planning
- Initial site remediation

Phase 2

- Hazardous material removal
- Demo of support buildings
- Prep for vessel removal

Phase 3

- Removal of irradiated hardware and vessel
- Demo of containment and bioshield
- FSS

Developed decommissioning-oriented policies, programs, and procedures covering key areas:

- Operations, Engineering
- RVI/RV segmentation and disposal
- Radioactive waste management
- Regulatory, Licensing, Radiation Protection, Security

SDS staff (100+) will be ready to support active D&D work following environmental permit process



SONGS

AECOM/ES Joint Venture entity
SONGSDecommissioningSolutions (SDS)
Decommissioning General Contract (DGC)

ALL SLIDES ARE ENERGY SOLUTIONS PROPRIETARY INFORMATION

Fort Calhoun

Fort Calhoun Decommissioning Project:

- Announced contract April 29, 2019
- EnergySolutions is partnering with OPPD (parent company to Fort Calhoun) to work with the Fort Calhoun workforce to safely decommission the facility
- The plant operated for forty-three years and officially shut down October 24, 2016
- Fort Calhoun generated 484 megawatts of electricity and was the smallest rated capacity of all commercial nuclear power plants in North America



10 CFR 50 Definition:

Safety-related structures, systems and components means those structures, systems and components that are relied upon to remain functional during and following design basis events to assure:

- (1) The integrity of the reactor coolant pressure boundary
- (2) The capability to shut down the reactor and maintain it in a safe shutdown condition; or
- (3) The capability to prevent or mitigate the consequences of accidents which could result in potential offsite exposures comparable to the applicable guideline exposures set forth in §50.34(a)(1) or §100.11 of this chapter, as applicable.
 - = [An individual located at any point on the boundary of the exclusion area for any 2 hour period following the onset of the postulated fission product release, would not receive a radiation dose in excess of 25 rem total effective dose equivalent (TEDE).]

#1 and #2 do not apply to permanently defueled reactor. Applicability of #3 based on Safety Analysis Report (SAR) analysis.

There may be ZERO safety-related plant following shutdown (e.g. at Zion).

NOTE: Final Safety Analysis Report (FSAR), Updated Final Safety Analysis Report (UFSAR), Defueled Safety Analysis Report (DSAR) are just different names for 'the SAR'.

The Licensee QA Program implements the “Graded QA” requirements:

- **Zion and La Crosse are NRC-approved Quality Assurance Project Plans (QAPPs) under the EnergySolutions QA Program.**
 - QAPPs are individually approved by the NRC
- **Other D&D projects are done under utility licensee QA Programs.**
 - In these cases project-specific QA Implementation Plans are issued under the EnergySolutions QA Program subject to utility approval.

The ‘project approach’ under the EnergySolutions QA Program is advantageous based on the fact that our QA Program is subject to NUPIC audit, and we are approved suppliers to utilities for services closely aligned with D&D projects.

Major Scope of Supply - ‘The Plant’:

Graded QA - Operations and Maintenance, with focus on -

- Spent fuel pool / cooling
- Rad effluent processing and monitoring
- Fire protection to protect the above

There may be Safety-Related modifications to plant for Dry Cask Storage System DCSS project, e.g.:

- DCSS (e.g., crane refurbishment, seismic bracing)
- Safety-related fuel work (e.g., ITTR, Sipping)

There may be other modifications to the plant subject to graded QA.

Major Scope of Supply – Waste shipping, processing and disposal:

- For *EnergySolutions*, this is via intra-company agreement under a Low Level Radioactive Waste (LLRW) subcontract.
- The LLRW subcontract invokes the *EnergySolutions*, QA Program, which utilizes a graded approach to quality based on significance of the activity to nuclear and radiological safety. LLRW scope typically includes:
 - 10 CFR 71 licensed Cask Fleet (Barnwell)
 - Transportation (Hittman)
 - Waste package design and supply
 - Large Component Removal (incl. Transportation Routes infrastructure)

Various Vendors are contracted in support of the above activities, with *EnergySolutions* QA Program requirements imposed on a graded basis.

Major Scope of Supply – Radiation Protection, including Final Status Survey (FSS) and License Termination Plan (LTP) Activities:

- QA Requirements for early work established in an FSS QAPP;
- LTP QA Requirements established in LTP (usually later in the project);
- Scope generally subject to QA requirements includes:
 - Waste Characterization Services
 - Laboratory Sampling
 - RP instrument calibrations

In general, vendor qualification basis is through NEI 1405 and the various certification methods described therein.

Various Vendors are contracted in support of the above activities, with EnergySolutions QA Program requirements imposed on a graded basis.

Other significant D&D Activities:

- **Environmental characterization services – generally invoke supplier QA programs.**
- **Demolition activities.**
 - No specific QA requirements based on SAR analysis
 - Primary consideration to Vendor industrial safety performance, experience, means and methods.

Various Vendors are contracted in support of the above activities.

In Closing...

SEFOR Before:



In Closing...

SEFOR After:



In Closing...

Zion Before:



In Closing...

Zion During:



In Closing...

Zion After:

