70 YEARS OF CREATING TOMORROW

Los Alamos NATIONAL LABORATORY

# LANL Mixed Waste Management Operations Improvements and Future State LA-UR-15-21458

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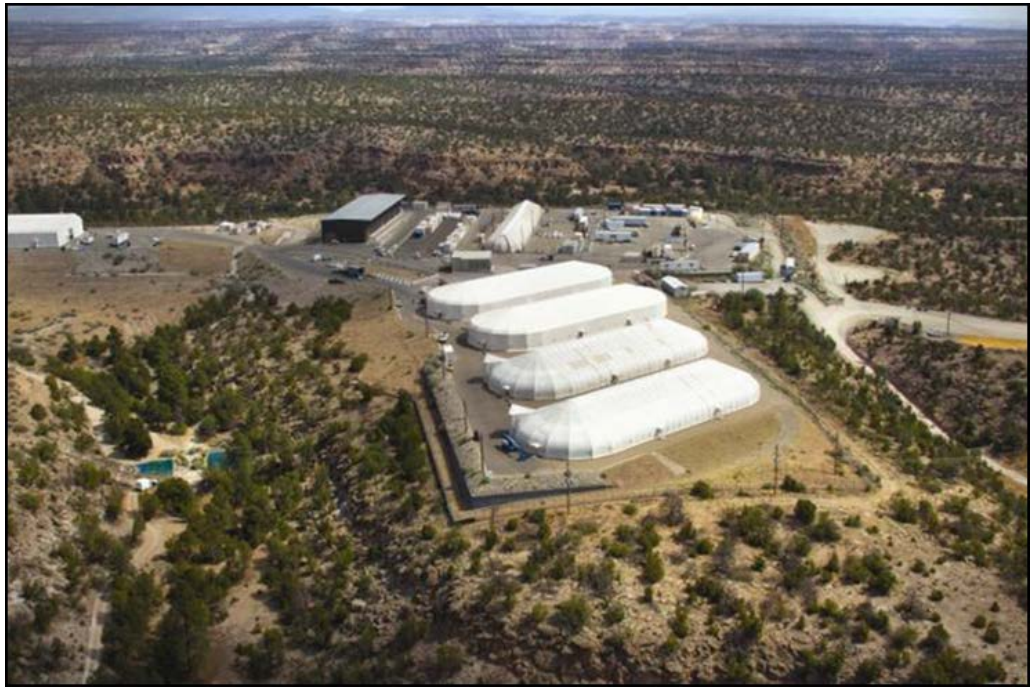
NNSA National Nuclear Security Administration

# LANL Enduring Waste Management Program Update

- How far has the LANL Enduring Mission Waste Management Program come?



# LANL Enduring Waste Management Program Prior to FY2014

- The LANL Enduring Mission Program is the responsible organization that manages all newly generated waste types.
  - LLRW
  - MLRW
  - Other Mixed Waste
  - Problematic waste streams
  - Newly Generated (NewGen) TRU
  - Hazardous/Chemical (Haz/chem)
  - Industrial waste

# LANL Enduring Waste Management Program Transformation FY2010-FY2013

- In FY 2010, LANL began site wide, Waste Management Program cultural and operational shift.
- The LANL Enduring Waste Management Program is now managed by one Associate Directorate, the Associate Directorate of Environmental Safety and Health (ADESH).
- ADESH certifies, manages, and supports single, site wide Enduring Mission Waste Management Program.

# LANL Enduring Waste Management Program Transformation FY2010-FY2013

- LANL has significantly reduced the generation of all routine waste types by implementing innovative waste reduction, reuses, reclassification, and other waste minimization strategies.
- LANL now has one master waste tracking and data management software program call WCATS.
- 99% of all waste is disposed of off-site at TSDFs.
- At the end of FY2015, the LANL Enduring Waste Management Program has now become outwardly focused and centralized, and has vastly improved its operational efficiency.

# LANL Waste Management in FY2015

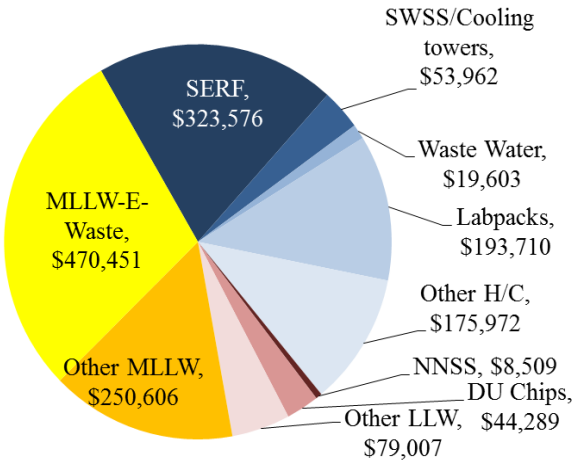
- Waste is generated, sorted, characterized and packaged in accordance with disposal site WAC and DOT Regulations
- Reduced residence time
  - Period between waste generation and disposal
- Increased transportation efficiency
  - Shorter routes, fuller trucks
- Decreased treatment costs
- Automated compliance reporting

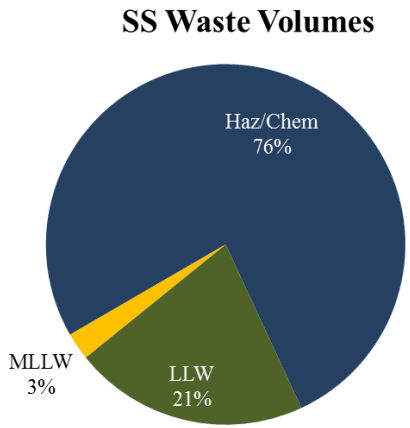
# Issues with Legacy Mixed Waste Generation

- Working off Legacy MLLW Waste;
  - Poorly characterized
  - May be improperly packed against current disposal site WAC and DOT regulations
  - Not certified against disposal site WAC
  - Waste data incomplete
- Results:
  - Required sorting, segregation, repackaging, treatment,
  - Compliance issues, no-path wastes, high costs.

# LANL Mixed Waste Management in FY2015

- LANL has historically over classified and conservatively characterized waste streams.
- This has lead to large volume of MLLW and an associated high cost for MLLW disposal



# LANL Mixed Waste Management in FY2015

- LANL has aggressively focused on reducing the amount of MLLW generated on site
  - Instituted high quality, in-depth Generator Training
  - Deployed WM Planning Services to implement waste minimization, waste avoidance practices at project start
- Intensify sorting and segregation operations to avoid introducing RCRA items into LLRW waste streams
- Increase decontamination efforts of potential MMLW and accurately characterize as LLRW

# LANL MLLW Waste Successes in FY2015

- Flanged Tritium Waste Container Path Forward Developed
- Cryo Traps Disposition
- TRU MLLW Reclassified as LLRW
- Container Vessel Disposition
- Electronics Rodeo to prevent introduction of electronics components into radiological areas
- Contaminated lead re-use program
- Alternate Disposal Strategies
- CMRR/RULOB Pre-Planning and MLLW Waste Prevention

# Problematic Waste Disposition: FTWC

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- The former waste management process has left LANL with two problematic waste streams;
  - FTWC Waste Stream #1contains tritium and tritium contaminated lead components (~100,000 Ci) that have >5% flammable gas, >10% void space, free standing liquids (~10%), in a non-DOT certified, pressurized container (>1.5 ATM)
- By exploring multiple commercial TSDF options and implementing an innovative shipping approach, this waste stream is now slated for treatment and disposal in FY15.
- The waste will be transported via a Type B Cask to a facility in Oak Ridge, TN where the hazardous components will be segregated out and repacked into a much smaller volume for disposal at a RCRA LLRW landfill. The remaining LLRW components will be packaged and certified for disposal at NNSS.

# Problematic Waste Disposition: Cryo Traps

- Cryo Trap Waste Stream #2 contains tritium and tritium contaminated elemental mercury (~80,000 Ci), contaminated lead components, >10% void space, and free standing liquids (~10%).
- By exploring multiple commercial TSDF options and implementing an innovative shipping approach, this waste stream is now slated for treatment and disposal in FY15.
- The waste will be transported via a Type B Cask to a facility in Oak Ridge, TN where the hazardous components will be segregated out and repacked into a much smaller volume for disposal at a RCRA LLRW landfill. The remaining LLRW components will be packaged and certified for disposal at NNSS.

# Other Problematic Waste Disposition Successes: TRU Aerosol Cans

- TRU Mixed Waste Decontamination and Reclassification
- Aerosol Cans classifies as TRU waste
  - Two strategies used to more accurately characterize waste
    - Surface Contaminated Object Program
    - Decontamination
- Reclassified aerosol cans shipped as MLLW for final treatment and disposal

# Other Problematic Waste Disposition Successes: Electronics Rodeo

- Size reduction of electronics components (computers, monitors, other types of electronics equipment) by removing potential RCRA constitutes (circuit boards, lead soldering, etc.) from electronics housing.
- Survey and release electronics components and dispose of non-radioactive RCRA waste

# Other Problematic Waste Disposition; Containment Vessel Disposition Project


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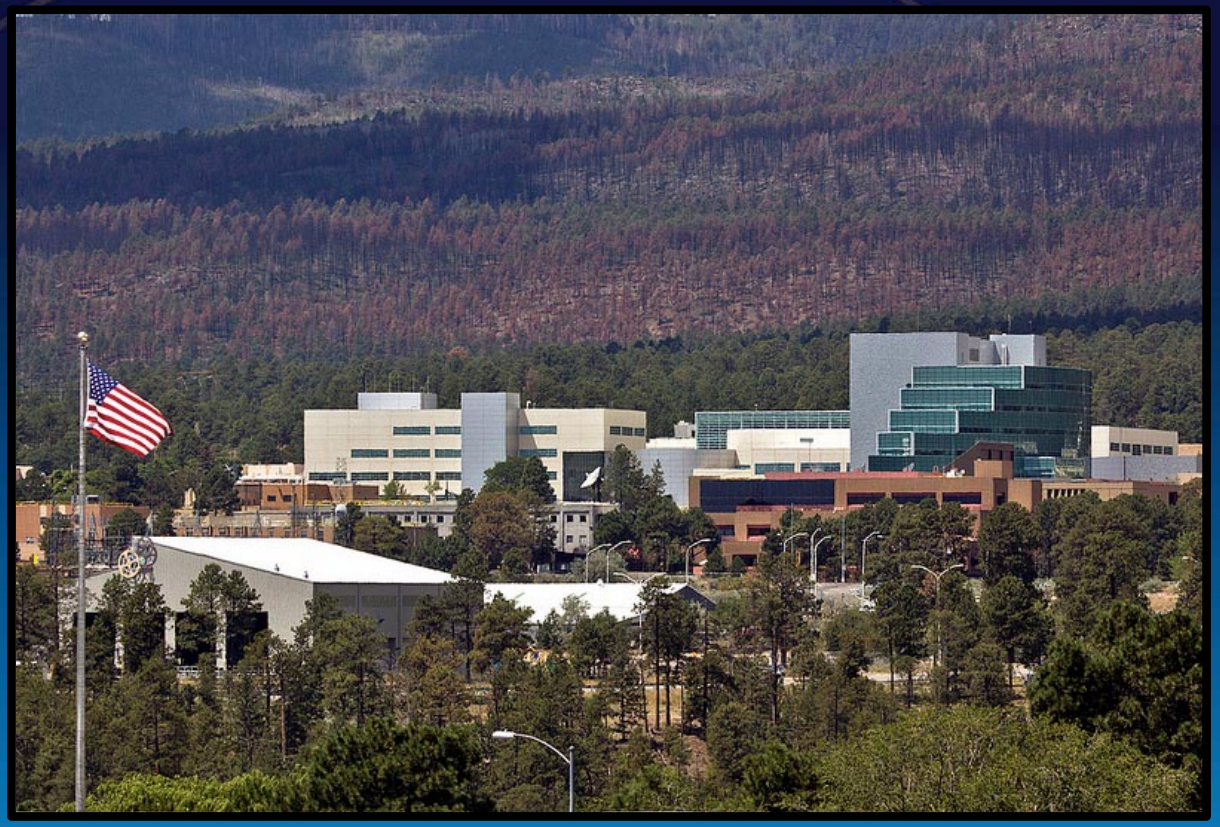
# Other Problematic Waste Disposition; Containment Vessel Disposition Project

- 9 “full content” 6-foot diameter confinement vessels with kg-quantities of Pu inside metal sphere
- Internal debris contaminated with heavy metals
- Cleaning of internal materials allowed RCRA constituents to be segregated as TRU Mixed Waste allowing the larger volume sphere to be decontaminated and disposed of as LLRW

# Lessons Learned and the Future of LANL MLLW Management

- LANL now works closely with Generators before the waste is created to define costs and multiple, alternate, and cost effective disposal paths.
- Waste at LANL is now generated, characterized, and packaged in accordance with disposal site WAC and DOT Regulations.
- LANL has reduced overall waste residence time to prevent legacy issues.
- LANL has decreased treatment costs by proper sorting and segregating potential mixed waste components.

# Questions or Comments?



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