

Allen, Pam, NMENV

From: Maestas, Ricardo, NMENV
Sent: Thursday, February 12, 2015 11:11 AM
To: Allen, Pam, NMENV
Subject: FW: LANL/WIPP - R&H Comm Reports
Attachments: LANL Legacy Waste Cleanup Status - P Maggiore rpt tp R&H Comm -7-23-14.pdf; LANL Update - WIPP Rad Release - Dr Sauer rpt to R&H Comm - 07-23-14.pdf



From: Pullen, Steve, NMENV
Sent: Thursday, July 24, 2014 2:12 PM
To: Kieling, John, NMENV; Kliphuis, Trais, NMENV; Maestas, Ricardo, NMENV; Smith, Coleman, NMENV; Holmes, Steve, NMENV; Hall, Timothy, NMENV; Briley, Siona, NMENV; Dale, Leslie, NMENV; Kraemer, Janine, NMENV
Subject: LANL/WIPP - R&H Comm Reports

See attached handouts regarding LANL/WIPP recent release provided to the Rad/Haz Committee July 23, 2014. Just FYI.

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LANL Legacy Waste Cleanup Status
for
Radioactive and Hazardous Materials
Committee

Peter Maggiore
Assistant Manager for Environmental Programs
Los Alamos Field Office

July 23, 2014



Outline

- ❑ **Background**
 - Consent Order Governs Cleanup
 - Risk Reduction Approach
 - 3,706 Campaign
- ❑ **WIPP Event**
 - Chronology of Events
 - Safety is Paramount
 - Regulatory Actions
 - What We Know So Far
 - How We Are Moving Forward
- ❑ **Environmental Clean Up Work Progress**
- ❑ **Important Environmental Cleanup Work Remains**
- ❑ **Budget Outlook**
- ❑ **Summary**

Background - Consent Order Governs Cleanup

- Signed by New Mexico Environment Department, NM Attorney General, DOE, and University Of California (since superseded by LANS) on March 1, 2005
- Issued pursuant to the New Mexico Hazardous Waste Act and New Mexico Solid Waste Act (under state RCRA authority)
- Order on Consent represented the first “fence to fence: legally enforceable cleanup agreement between DOE and the State of New Mexico over legacy cleanup at LANL”
- Prescriptive – not clearly risk based
- Mechanism for implementing RCRA Corrective Actions
- Required the Department to complete all Cleanup Activities no later than December 2015
- Order on Consent assumed cleanup funding levels that never materialized
- DOE publically acknowledged in January 2012 that it will not meet the 2015 completion milestone

Sept 2011 - started framework agreement - risk based prioritization - went public

Background - Risk Reduction Approach

- ❑ **Cerro Grande (2000) and Las Conchas (2011) Fires focused attention on TA-54 TRU Waste**
- ❑ **Opportunity to shift to a Risk Reduction Approach**
 - Began preliminary discussions with NMED shortly after New Mexico's Administration change in January 2011 and met with NM Governor Susana Martinez on September 13, 2011
 - Framework Agreement rolled out to the public at the Northern New Mexico Citizens' Advisory Board meeting on January 5, 2012
- ❑ **Framework Agreement Realignment Environmental Priorities based on Risk Reduction Approach**
 - Removal of non-cemented above-ground TRU currently-stored at Area G by June 2014 (3,706 m³)
 - Removal of all newly generated TRU waste received in Area G during FY12/FY13, by December 2014
 - Develop schedule for disposition of the below-ground TRU at Area G by December 2012 (Completion by 2018, except 33 shafts)
 - Groundwater and surface water protection also emphasized

Background - 3,706 Campaign

- ❑ **3,706 Status**
 - 3,327 of 3,706 removed from LANL
 - 90% of Volume
- ❑ **On May 30, DOE announced that the 3,706 Campaign would not be completed on schedule due to the suspension of disposal operations at WIPP & the ongoing evaluation related to the treatment and remediation of LANL's unconsolidated nitrate salt bearing waste**
- ❑ **All TRU Waste Operations are paused while the cause of the WIPP event is investigated**



WIPP Event - Chronology of Events

- ❑ **February 5: WIPP Underground Fire**
- ❑ **February 14: Radiological Release**
- ❑ **April 1: LANL began shipping TRU waste to WCS for temporary storage and ultimate disposal at WIPP pending resumption of operations**
- ❑ **May 1: Curtailed shipments to WCS based on concerns from WIPP related to Nitrate Salts waste stream**
- ❑ **May 15: LANL Nitrate Salt Waste Drum Breach confirmed**
 - AIB has yet to determine cause vs. effect
- ❑ **LANL Nitrate Salt Waste Drum Locations**
 - 86 (57 remediated, 29 un-remediated) Nitrate Salt Drums remain at LANL
 - 116 Nitrate Salt Drums reside at WCS for temporary storage
 - 55 Nitrate Salt Drums are in Panel 7 at WIPP
 - 453 Nitrate Salt Drums are in Panel 6 at WIPP (Count includes "Suspect" Drums)

WIPP Event - Safety is Paramount

❑ LANL Has Taken Rigorous Precautions to Secure the Nitrate Salt Waste Drums

- Over-packed in Secondary Containment
- Daily Thermographic Measurements
- Continuous Air Monitoring
- Stored in Boxlines with Continuous Ventilation and HEPA Filtration
- All Storage Locations Equipped with Fire Suspension
- Vegetation Controls in Area G are in Place to Protect Domes Against Wildfire
- Emergency Response (if required) is in Place



Standard Waste Boxes in Dome 375

WIPP Event - Safety is Paramount

□ At WCS:

- Containers are retrievably stored within the Federal Waste Facility
- Daily Thermographic Measurements
- Over-packed in secondary containment (standard waste boxes)
- Over-packed in tertiary containment (mobile concrete containers)



Mobile Concrete Containers



LANL TRU Waste at WCS

WIPP Event - Regulatory Actions

- ❑ **May 19: NMED issues Administrative Order**
 - LANL Responded with a Container Isolation Plan on May 21
 - NMED Issued Contingent Approval on May 23
 - LANL Answered Additional Questions and Resubmits A Revised Plan on May 29
- ❑ **June 16: NMED sends LANL a request for additional information regarding the generation and treatment of hazardous waste at LANL**
 - LANL submitted the requested information by the response date of July 3
- ❑ **July 1: LANL Self Discloses Noncompliance with Hazardous Waste Permit**
 - Unpermitted Treatment (used reagents to neutralize waste without a permit – did not remediate appropriately)
 - Failure to Reevaluate Acceptable Knowledge Determination (did not reevaluate the unconsolidated nitrate salt-bearing waste to assess accuracy of the initial waste characterization)

WIPP Event - What We Know So Far

- ❑ One LANL TRU Nitrate Salt drum has been visually observed to have undergone an energetic event
 - Resulted in failure of the physical integrity of the drum
 - Material release appears to have occurred
- ❑ The LANL drums contain nitrate salts and various organic constituents (waste materials and liquid absorbents)



Known Breached Drum at WIPP

WIPP Event - How We Are Moving Forward

- Continuing to Work Cooperatively with WIPP and the Accident Investigation Board to determine the cause of the February 14 Radiologic Event
- Cooperating with and assisting DOE's Technical Assistance Team
- LANL has designated a Principal Associate Director as the Recovery Manager reporting directly to the Laboratory Director
- Treatment Team has been commissioned and is evaluating a path forward to treat the Nitrate Salt Waste Containers
- Comprehensive review of our management systems, procedures, and practices is ongoing

Environmental Cleanup Work Progress

□ Soil & Water Remediation Progress

- Completed investigations and remediations and received certificates of completion for 1,117 of the 2,123 SWMUs owned by the Program
- Completed 9 out of 29 aggregate areas
- Completed 11 of the 26 Material Disposal Areas in the Consent Order
- Installed and maintained over 140 groundwater monitoring wells
- Installed and maintained 52 gage stations and monitored 250 sites with over 1000 storm water controls
- Consent Order – Completed 1117 of 2123 Potential Release Sites
- Monitoring – 140 well locations and 175 surface waste locations



Important Environmental Cleanup Work Remains

❑ TRU Waste

- Remaining Above-Grade Legacy Waste
- FY12/FY13 TRU Waste
- Below Grade Retrievals planning:
 - CMP Disposition
 - Trenches A-D/Pit 9
 - Hot Cell Liners, Tritium Tanks & 17th Canister
- 33 Shafts

❑ Remediation

- Water Protection
- Bias for Action
- Aggregate Areas and Technical Area 21 (TA-21)
- MDA Remedies



Important Environmental Cleanup Work Remains

❑ Institute a Risk Based Approach Around Discrete Projects

- Based on measurable risk reductions
- High Importance to Stakeholders
- High Importance to Regulators

❑ Top 4 Risk Based Cleanup Action Projects are

- Chromium Contaminated Ground Water
- Royal Demolition Explosive (RDX) Contaminated Ground Water
- Surface Water Boundary Protection
- Individual Storm Water Permit Controls & Compliance (USEPA)

*1st pilot extraction well
700 ft large diameter
pilot adjacent to
San Ildefonso Pueblo
will be pilot well on SFP.*



Important Environmental Cleanup Work Remains

❑ Bias for Action

- MDA L SVE

*med'l dispose area
Soil Vapor extraction S*

❑ MDA Remedies

- MDA H
- MDA C
- MDAs G and L
- MDAs A and T
- MDA AB

*64 area landfill
in area C(?)*



❑ Aggregate Areas and TA-21

- Complete Site Investigations
- Administrative Sites Completion
- Historical Properties Completion
- TA-21 D&D and Site Completion
- General's Tanks Removal
- Priority Site Cleanups



Budget Outlook

□ FY14 Budget

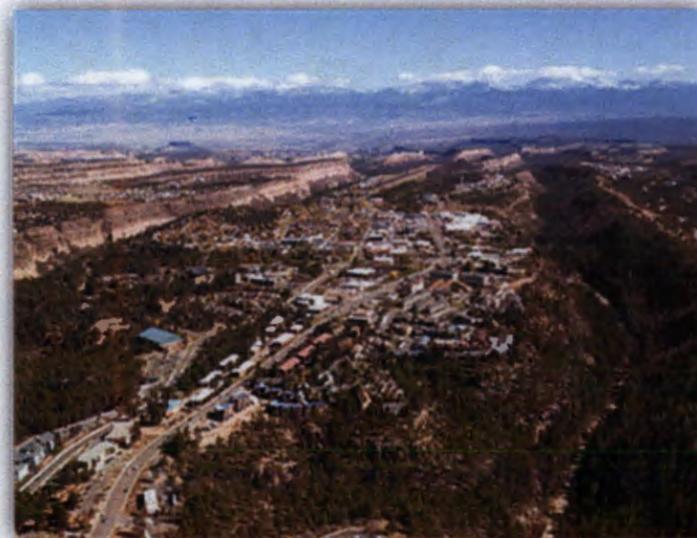
- FY14 Appropriation = \$225M

□ FY15 Budget

- FY15 President's Budget Request = \$225M
- House Energy and Water Mark = \$175.4M for LANL
- Separate \$4.6M for Chromium Pump and Treatment Facility (Line Item Construction)

□ FY16

- Budget Numbers Embargoed



Summary

- ❑ Significant Cleanup work has been accomplished
- ❑ Public and worker safety is LANL's first priority
- ❑ Relationship with our Regulators is Paramount to Meeting our Responsibilities
- ❑ Environment is a Public Program





Radiological Release at WIPP: Update on Activities & Impacts

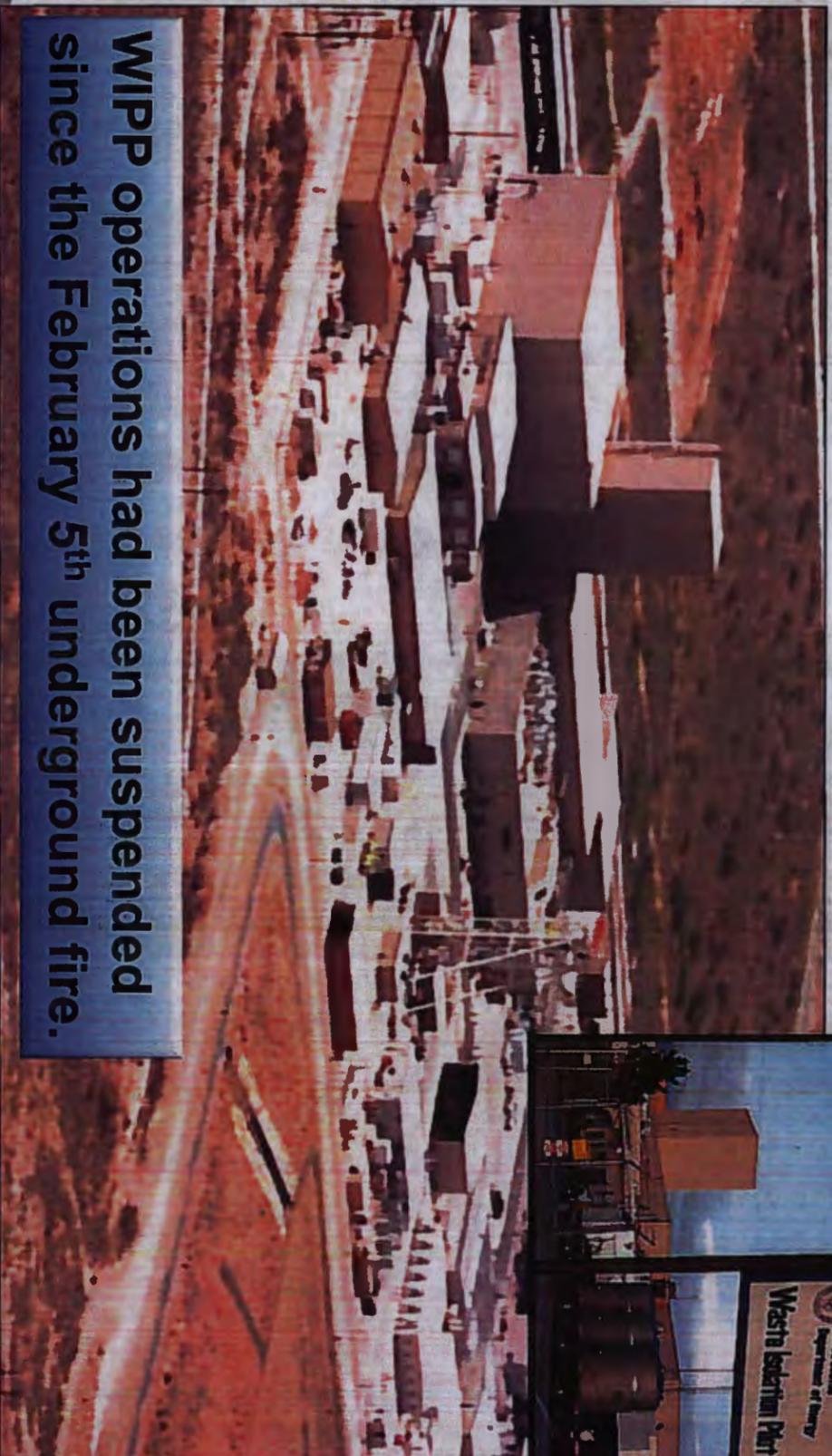
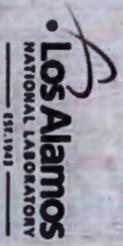
Dr. Nan Sauer

Leader for Internal Technical Investigation
& Associate Director for Chemistry, Life & Earth Sciences

July 23, 2014



February 14, 2014:
First Continuous Air Monitor (CAM) alarmed at 11:14 P.M.



WIPP operations had been suspended since the February 5th underground fire.

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What is TRU waste?

TRANSURANIC WASTE

92 U 238.0 Uranium	93 Np [237] Neptunium	94 Pu [244] Plutonium	95 Am [243] Americium	96 Cm [247] Curium
97 Bk [247] Berkelium	98 Cf [251] Californium	99 Es [252] Einsteinium	100 Fm [257] Fermium	101 Md [258] Mendelevium
102 No [259] Nobelium	103 Lr [260] Lawrencium	104 Rf [261] Rutherfordium	105 Db [262] Dubnium	106 Sg [266] Seaborgium
107 Bh [264] Bohrium	108 Hs [277] Hassium	109 Mt [268] Meitnerium	110 Ds [271] Darmstadtium	111 Rg [272] Roentgenium



At LANL, TRU waste consists of clothing, protective shoe covers, tools, wiping rags, mops, filters, gloves, soils, laboratory equipment, residues, or liquids contaminated with radioactive material—mostly plutonium.

The vast majority of LANL's TRU waste is "legacy" waste created before 1991, during decades of nuclear research and production.



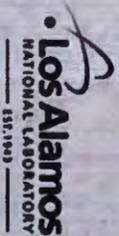
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Timeline



Radiation release traced to Panel 7, Room 7

Damage confirmed to LANL waste drum

DOE notifies NMED that the 3706 Campaign will not be completed on deadline

Radiation alarm from continuous air monitor

Feb 14 Mar 28 Apr 23 May 1 May 15 May 23 May 30

AIB completes Phase 1 investigation

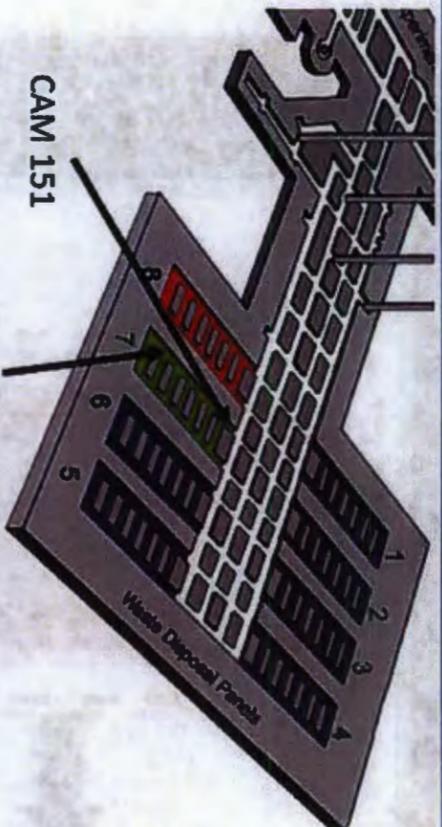
WIPP declared PISA for potential reactive waste in LANL TRU drums

NMED approves the LANL Nitrate Salt-Bearing Waste Container Isolation Plan (with contingencies)

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A look inside Panel 7, Room 7

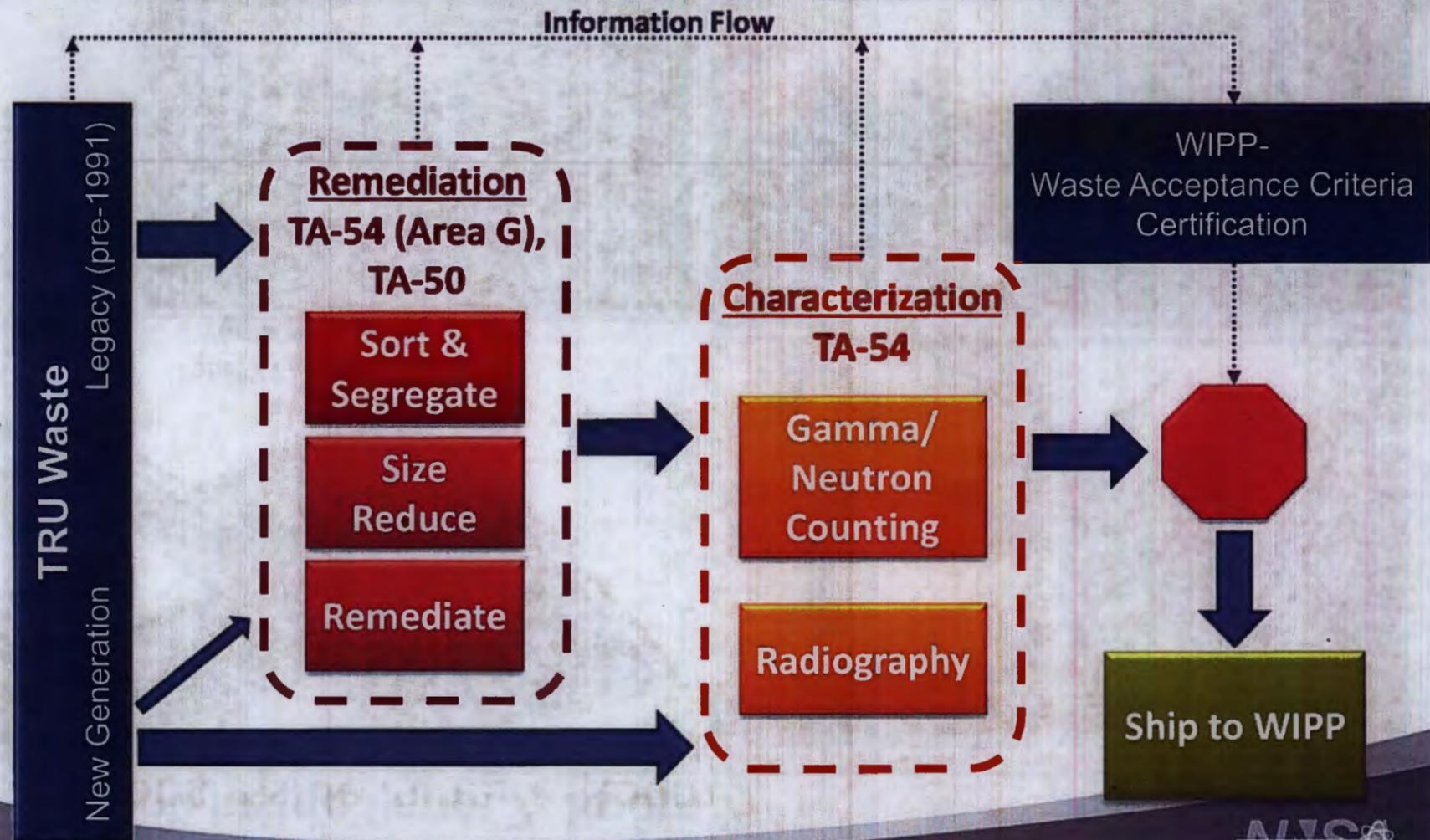


Panel 7 Room 7
Waste Face



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Simplified TRU Waste Process Flow at LANL



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| July 22, 2014 | 4

Managing TRU Waste at Los Alamos

TA-55

What was the waste?



WCRR

How was it processed?

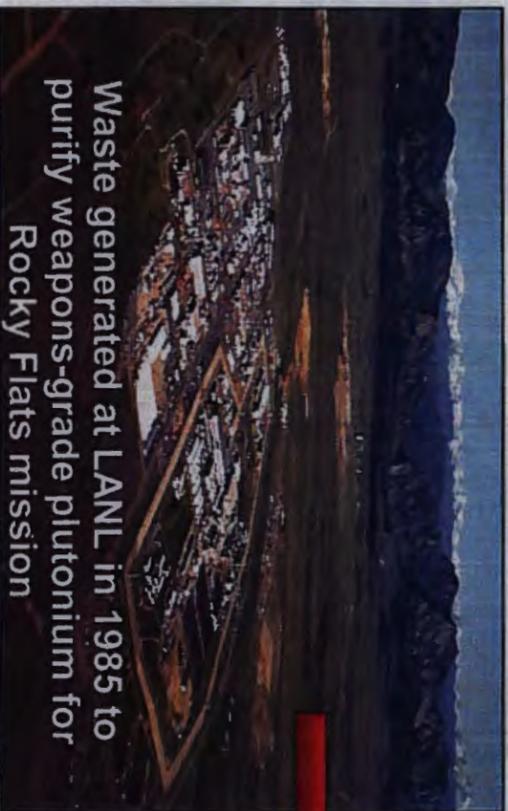


AREA G

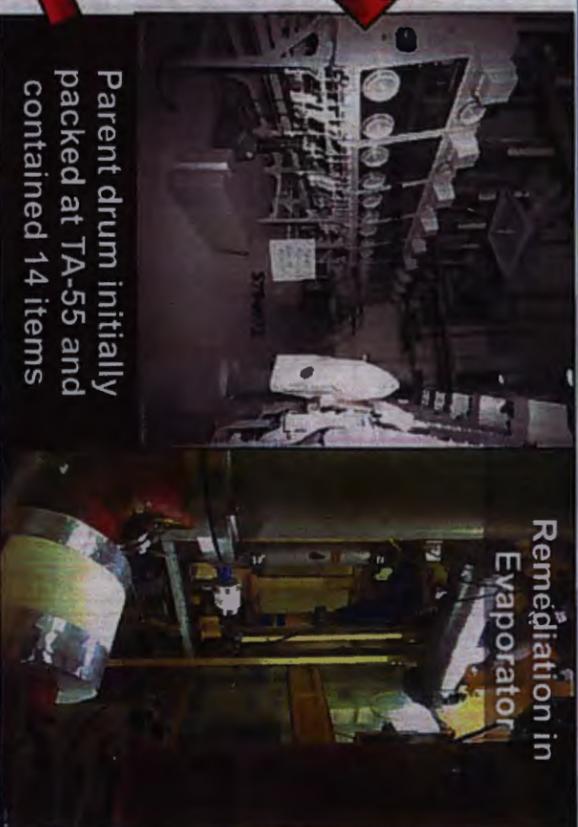
Did it meet WIPP-WAC?



The History of Drum 68660



Waste generated at LANL in 1985 to purify weapons-grade plutonium for Rocky Flats mission



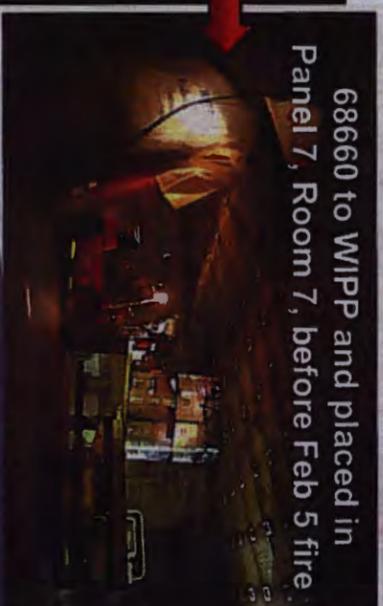
Parent drum initially packed at TA-55 and contained 14 items



Two daughter drums packaged in December 2013



Real Time Radiography of Drum 68660



68660 to WIPP and placed in Panel 7, Room 7, before Feb 5 fire

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July 22 2014 18

LANL Actions & Ongoing Activities



Suspended LANL shipments to WCS (Waste Control Specialists in Andrews, TX).

Evaluated remaining waste inventory at LANL and WCS. Remediated by moving nitrate salt wastes into standard waste boxes/concrete casks and then into structures with fire suppression and controlled ventilation.

Responded to New Mexico Environment Department's Administrative Order.

Participating in Accident Investigation Board review.

Coordinating multi-Lab Technical Analysis Team. Secured samples of interest with tamper-indicating devices.

Sent LANL's 3706 Program Director to WIPP as liaison.

Chartered internal investigation to identify potential compliance issues with DOE contract requirements, hazardous waste regulatory requirements, and DOE nuclear safety requirements.

Designated Dr. Terry Wallace as WIPP Recovery Manager:

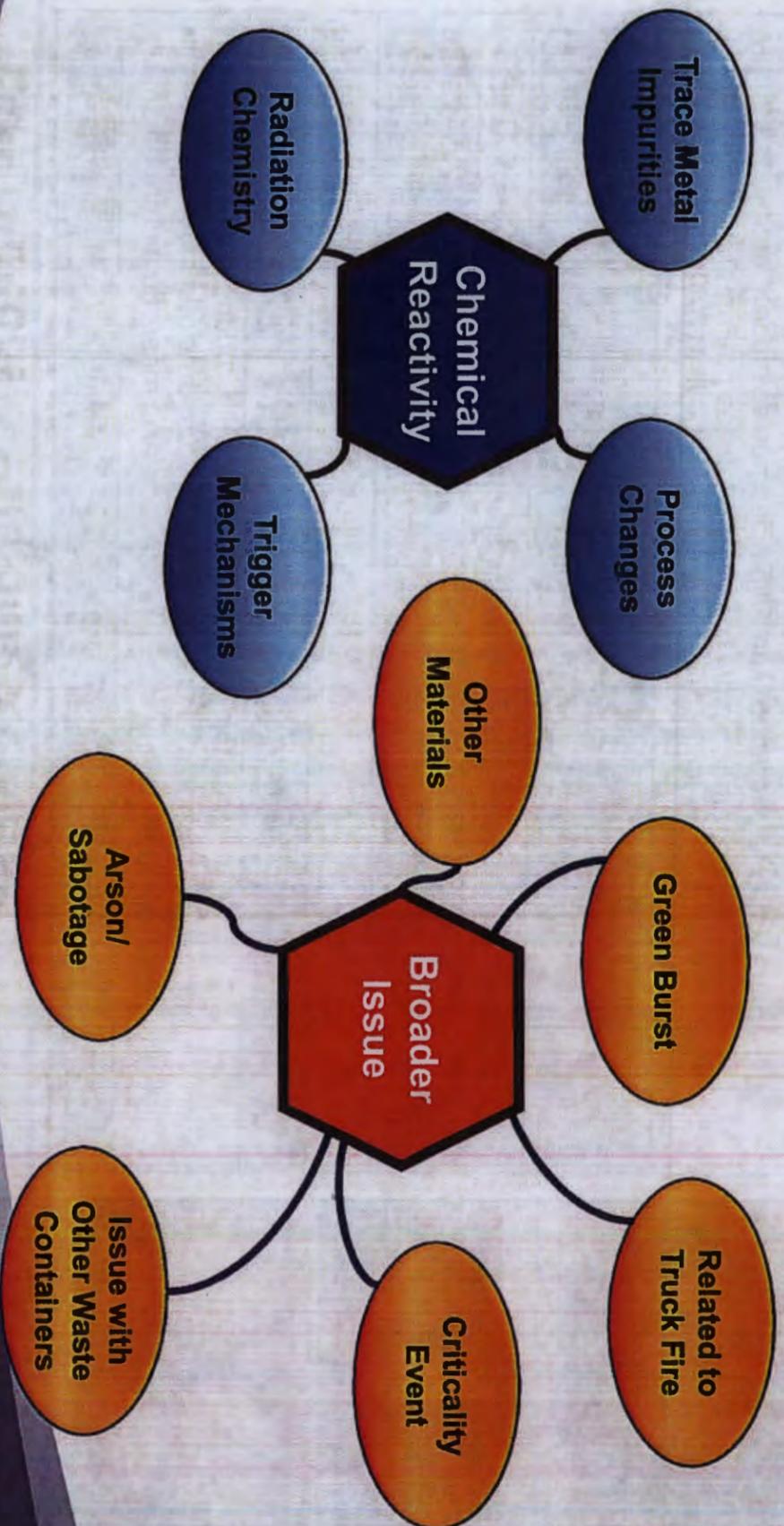
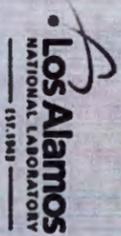
- 1) ensure we are safe and secure in ALL TRU waste operations;
- 2) understand the processes and packaging environment that contributed to the uncertainties surrounding the WIPP event; and
- 3) confirm that processing, packing, and shipping are integrated in a manner that ensures the safety, security, and integrity of the management of our waste streams.



Swheat kitty litter

What caused Drum 68660 to breach?

Two hypotheses considered in this complex investigation



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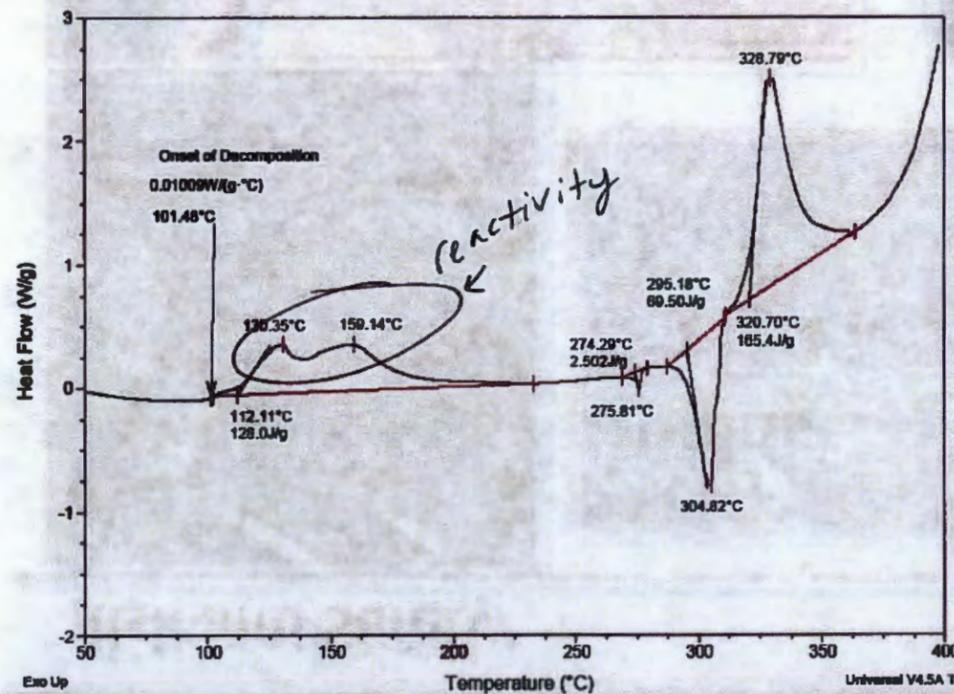
July 22, 2014 | 10

Investigating and characterizing the unique chemistry of 68660



Materials

Swheat kitty litter, lead, tungsten-lined gloves, neutralizers, acid, nitrate salts



Experimental Analysis

- Energetic properties of Swheat/nitrate mixtures
- Thermal behavior
- Accelerated Rate Calorimetry
- Decomposition and reactive byproducts
- Evolved gases characterization

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July 23, 2014 | 11

measurement of reactivity

Did our management systems, procedures, and practices contribute to the incident?



Roles & Responsibilities

Did everyone have a clear understanding of the roles of the myriad participants—internal and external to the Lab? Were authorities clearly identified?

Procedures

Did we have configuration control over changes to the baseline? Were changes clearly communicated to all participants?

Orders, Regulations, Policies, Contract, Consent Order

Did we comply with applicable requirements and direction?

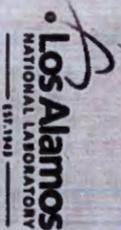
Practices

Were our practices dependent on personnel, schedules, different interpretations of requirements, or other variables?

Integration

Did we manage operations as “one Lab?”

Priorities Today



DETERMINE
what happened

RESTORE
WIPP and
resume national
operations there

ENSURE
that the entire TRU
waste stream is safe

PROTECT
the public and
the environment

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July 22, 2014 | 14