



New Mexico Environment Department

Presentation to Los Alamos County Board of Public Utilities June 3, 2026

Presented by New Mexico Environment Department
Resource Protection Division
Director Russell Lashley



Universal Principle

Common Ground



We all want clean drinking water



Topic for Today's Public Information Session

- Hexavalent Chromium from a LANL power plant persists and is:
 - Present in the Soil and Water
 - Present in Los Alamos County
 - Present in Santa Fe County



LANL'S Use of Hexavalent Chromium

From 1956 to 1972, LANL periodically flushed hexavalent chromium-contaminated water into Sandia Canyon and Mortandad Canyon.





Hexavalent Chromium Contamination

- The hexavalent chromium contamination spread and expanded into the aquifer (effluent driven water flows)
- In the ~54 years since 1972, the plume spread both horizontally and vertically



Hexavalent Chromium Contamination Risks

Long-term ingestion of hexavalent chromium can cause serious health problems, including an increased risk of certain cancers





LANL's Remediation System

- LANL's remediation approach is to extract contaminated water and treat it through a Pump-and-Treat system
- Hexavalent Chromium Contamination is measured in parts per billion ("ppb")



LANL's Disposal of Treated Water

- LANL evaluated ways to dispose of the treated water:
 - Remove the treated water and deposit it into lined ponds
 - Evaporative systems
 - Deposit the treated water onto soil
 - Inject the treated water back into the aquifer



HWB and GWQB Regulate LANL's Operation of Pump-and-Treat System

- The Hazardous Waste Bureau (HWB) of the New Mexico Environment Department regulates LANL's extraction and treatment under the NM Hazardous Waste Act and its rules
 - Executed through the Compliance Order on Consent
- The Ground Water Quality Bureau (GWQB) of the New Mexico Environment Department regulates the injections of treated water under the NM Water Quality Act and its rules



LANL's Theory of Containment

- LANL hypothesized the designed pump-and-treat system could keep hexavalent chromium contamination levels within facility property and prevent spread of the plume
 - For multiple years, the Ground Water Quality Bureau expressed concern that the ground water samples showed increasing contaminant levels and spread of the plume
 - For multiple years, LANL pushed back and asserted that its system was containing the hexavalent chromium plume
 - But data showed otherwise



Hexavalent Chromium Plume Violated Regulatory Requirements in Los Alamos County

- **Hexavalent Chromium Contamination Levels in Groundwater Exceeded Regulatory Requirement of 50 ppb**
 - In 2004, ground water samples showed hexavalent chromium contamination trends at Well R-28
 - In 2019, ground water samples showed hexavalent chromium contamination trends at Well R-70
 - In 2021, ground water samples showed hexavalent chromium contamination trends at Well R-45
 - These wells are in Los Alamos County



Monitoring Well of Primary Concern

- **At R-45, LANL exceeded 50 ppb (12/2020)**
 - Continued to increase up to almost 70 ppb (10/2022)
 - Independent Review Team concluded that the trends are plausibly resulting from injection (12/2024 Report)
 - Injection into CrIN-1 and CrIN-2 increased vertical downward gradients
 - Drove mass horizontally to the east and vertically downward
 - Cessation of injection in the eastern side of the plume caused detections to decrease and begin to stabilize (12/2022 GWQB Cease Injection Directive)



LANL Failed to Contain the Hexavalent Chromium Plume

- Proven hexavalent chromium contamination in groundwater samples from Pueblo de San Ildefonso lands
 - Monitoring Well SIMR-3 is in the northern part of Pueblo de San Ildefonso
 - SIMR-3 samples showed the hexavalent chromium plume had spread beyond LANL and into Pueblo de San Ildefonso
 - Hexavalent chromium concentrations:
 - 98.9 ppb in May 2026
 - 90 ppb in March 2026
 - 72.9 ppb in October 2025



LANL Violated Regulatory Requirements

- **Monitoring Well SIMR-3 Samples Prove the Plume is Not Contained Within LANL Property**
 - **Violated Primary Goal of Interim Measures**
- **Monitoring Well R-45 Samples Prove LANL exceeds regulatory requirements downgradient of operations**
- **Injections adjacent to R-45 likely increased the spread of the plume**



Regulatory Response – Ground Water Quality Bureau

- In response to regulatory exceedances, the Ground Water Quality Bureau of the New Mexico Environment Department required LANL to stop injecting treated extractions back into ground water
 - Trends, like those at R-45, showed uncontrolled migration of hexavalent chromium into previously uncontaminated areas due to injections
- On February 11, 2026, the Ground Water Quality Bureau served LANL with an Administrative Compliance Order that listed violations and penalties
 - Violation 1. Failure to meet regulatory water quality standards in NMAC 20.6.2.3103
 - Violation 2. Failure to meet the requirements of Discharge Permit 1835, Permit Condition 19



Resumption of Injections Urged by LANL in between the 2022 and 2026 Cease Injection Directives

LANL repeatedly argued for immediate resumption of injections after the 2022 Ground Water Quality Bureau cease injection directive

- The Ground Water Quality Bureau conditioned the resumption of injections on these requirements:
 - LANL shall evaluate and propose additional, alternative injection sites
 - To ensure that injection does not increase migration of hexavalent chromium
 - LANL shall use data from Monitoring Well SIMR-3 to evaluate if injections should continue in the southern boundary
 - LANL shall install Monitoring Well R-80 to determine if injection should be allowed in the east



LANL Pushed Back with Skewed Data from Flooded Monitoring Well

- Monitoring Well R-50 is located directly north of the southern Injection Wells CrIN-3, CrIN-4, CrIN-5
- Flooding the area near R-50 with treated water injections produces cleaner ground water samples
 - LANL used R-50 samples to argue that its methods worked
 - LANL used R-50 samples to push for resumption of injections
 - New data from Monitoring Well SIMR-3, south of injection wells, indicate that LANL's injections spread the hexavalent chromium plume



LANL Pushed Back on System Modifications

LANL pushed back and refused to commit to additional, alternative injection locations

- The Ground Water Quality Bureau allowed injections again in 2024 provided that LANL agree that:
 - Monitoring Well SIMR-3 would inform future actions
 - An Independent Review Team would study options and its recommendations would inform the path forward



Regulatory Response – Hazardous Waste Bureau

- On February 11, 2026, the Hazardous Waste Bureau served LANL with an Administrative Compliance Order that listed regulatory violations, penalties, and correction action plan requirements
 - Violation 1. Failure to submit revised interim measures work plan
 - Violation 2. Failure to implement corrective measures beyond the facility property boundary where necessary



Corrective Action Plan in ACO

- Hazardous Waste Bureau's Corrective Action Plan for LANL is in the Administrative Compliance Order
- The Corrective Action Plan aligns with recommendations by the Independent Review Team
 - Supports follow through with the actions Hazardous Waste Bureau has been requiring, with push back from LANL, since 2022



LANL Impasse

- LANL refused to act on multiple directives for remedial measures without a blank check, aka, a “Final Remedy” that would reduce the exercise of regulatory authority and public involvement
- But there is not enough data for a Final Remedy
 - e.g., the plume is not well-characterized and the center of the plume is not known
- NMED proposed that LANL act on multiple remedial measures under an “Interim Measures” model – this allows for adaptive management while necessary data is collected to inform additional remediation decisions
- LANL continued to refuse to improve the efficacy of its Pump-and-Treat system



Independent Technical Review

- New Mexico Environment Department and LANL agreed to have the facts reviewed by an Independent Technical Review Team
 - Jointly developed the scope of analysis
 - Purpose: resolve differences of opinion between the New Mexico Environment Department and LANL on:
 - Hexavalent chromium migration
 - Containment of the hexavalent chromium plume
 - Remediation of the hexavalent chromium contamination in groundwater



Independent Technical Review Team Selections

The New Mexico Environment Department and LANL agreed on the following experts:

1. **Scott Ellinger, *U.S. EPA Region 6***
2. **Matthew Tonkin, *S.S. Papadopulos & Associates, Inc.***
3. **John Devlin, *University of Kansas***
4. **Charles Newell, *GSI Environmental Inc.***
5. **Sorab Panday, *GSI Environmental Inc.***
6. **Ines Triay, *Florida International University***
7. **Fred Day-Lewis, *Pacific Northwest National Laboratory***
8. **Inci Demirkanli, *Pacific Northwest National Laboratory***
9. **J. Alexandra Hakala, *DOE's National Energy Technology Laboratory***
10. **Brian Looney, *Savannah River National Laboratory***
11. **Mark Rigali, *Sandia National Laboratories***
12. **Daniel B. Stephens, *Daniel B. Stephens and Associates***
13. **Haruko Wainwright, *Massachusetts Institute of Technology***
14. **David Wilson, *Longenecker & Associates***



Independent Technical Review Goals

ITR GOALS: Evaluate the existing data and provide answers to these five technical topics:

1. Interim measure hydraulic control
 - Evaluate trends for adverse impacts from injection
 - Determine if current interim measure will be protective and hydraulically control hexavalent chromium plume
2. Hexavalent Chromium Plume modeling
 - Review of software and technical defensibility of assumptions and inputs
3. Review of conditions precedent for restart
 - Review of technical basis for regulatory directives
 - Alternative injection location
4. Regulatory matters
 - Interim measures vs. corrective measures evaluation
 - Adaptive management strategy
5. Well design
 - Dual screen wells sealed with bentonite



Report by Independent Technical Review Team - December 2024

ITR Team Determinations:

LANL's Interim Measures do not hydraulically control hexavalent chromium plume

- Improperly managed injections do not serve remediation
- Injections of treated water appear to be expanding plume boundaries
- Injections into the plume cannot be the only way to dispose of treated water

LANL's current system, as is, is not protective of the environment

- The current system has critical data gaps
- The critical data gaps undermine LANL's modeling reliability
- The system needs modifications to address the deeper contamination

Link to Report: <https://www.env.nm.gov/hazardous-waste/wp-content/uploads/sites/10/2026/02/Attachment-53-December-30-2024-1.pdf>



Independent Technical Review Team Conclusions and Recommendations - #1

- **Interim measure hydraulic control**
 - Existing system will not contain all hexavalent chromium migration and needs to be modified, reconfigured and possibly expanded
 - More than likely that injection adversely impacted ground water at Well R-45 and could have enhanced downward migration
 - Recommended a partial restart of Injection Wells CrIN-4 and CrIN-5 and Extraction Wells CrEX-4 and CrEX-5
 - Recommended converting CrIN-1 into an extraction well
 - Recommended potentially another extraction well in the eastern area



Independent Technical Review Team Conclusions and Recommendations - #2

- **Hexavalent chromium plume modeling**
 - Recommended converting FEHM model to a MODFLOW model
 - To increase transparency
 - Reevaluate representation of key parameters to adequately reflect site data
 - To address data gaps in current model



Independent Technical Review Team Conclusions and Recommendations - #3

- Review of conditions proposed by Ground Water Quality Bureau for Restart of System
 - Independent Review Team agreed that the Ground Water Quality Bureau's conditions were technically defensible and should be implemented
 - Agreed with the Hazardous Waste Bureau that the increased extraction capacity would improve hydraulic control (and thus plume containment)
 - Supported immediate expansion of the pump-and-treat system, reference multiple options to do so
 - Recommended partial restart of the pump-and-treat system while LANL constructs additional, alternative injection location(s) at the earliest practical date



Independent Technical Review Team Conclusions and Recommendations - #4

□ Regulatory Matters

- Existing information from LANL is not enough for LANL to propose and evaluate final remedy alternatives
 - Data gaps persist
 - Not enough information to select a final remedy
- Independent Review Team concluded that remediation and investigation should occur using adaptive management under interim measures
 - Use ground water samples to guide future decisions and modifications to the system



Independent Technical Review Team Conclusions and Recommendations - #5

- **Well Screens**
 - Recommended Dual Screens for Wells where appropriate
 - This is under the jurisdiction of the Office of the State Engineer



October 2025 – Present: SIMR-3 Results After the Independent Technical Review Team Report

Knowledge of contaminated water from monitoring well SIMR-3 on Pueblo de San Ildefonso land:

- Came after the Independent Review Team Report
 - Which supported the Department's proposed adjustment of operations based on SIMR-3 results
- Highlighted the necessity for immediate action and adaptive management to improve remediation



LANL Halted Progress on Hexavalent Chromium Plume Workshops

- LANL canceled Hexavalent Chromium Plume Workshops after NMED served Administrative Compliance Orders in February 2026
- NMED urged the resumption of collaborative workshops
 - These participants met in May 2026 to resume implementation of the Independent Review Team recommendations and conclusions:
 - Pueblo de San Ildefonso
 - New Mexico Indian Affairs Department
 - New Mexico Office of the State Engineer
 - New Mexico Environment Department
 - LANL rejected the invitation to join the resumed workshops



LANL Hesitation to Implement Independent Technical Review Team Recommendations

To date, LANL has not implemented Independent Review Team recommendations





Questions?

