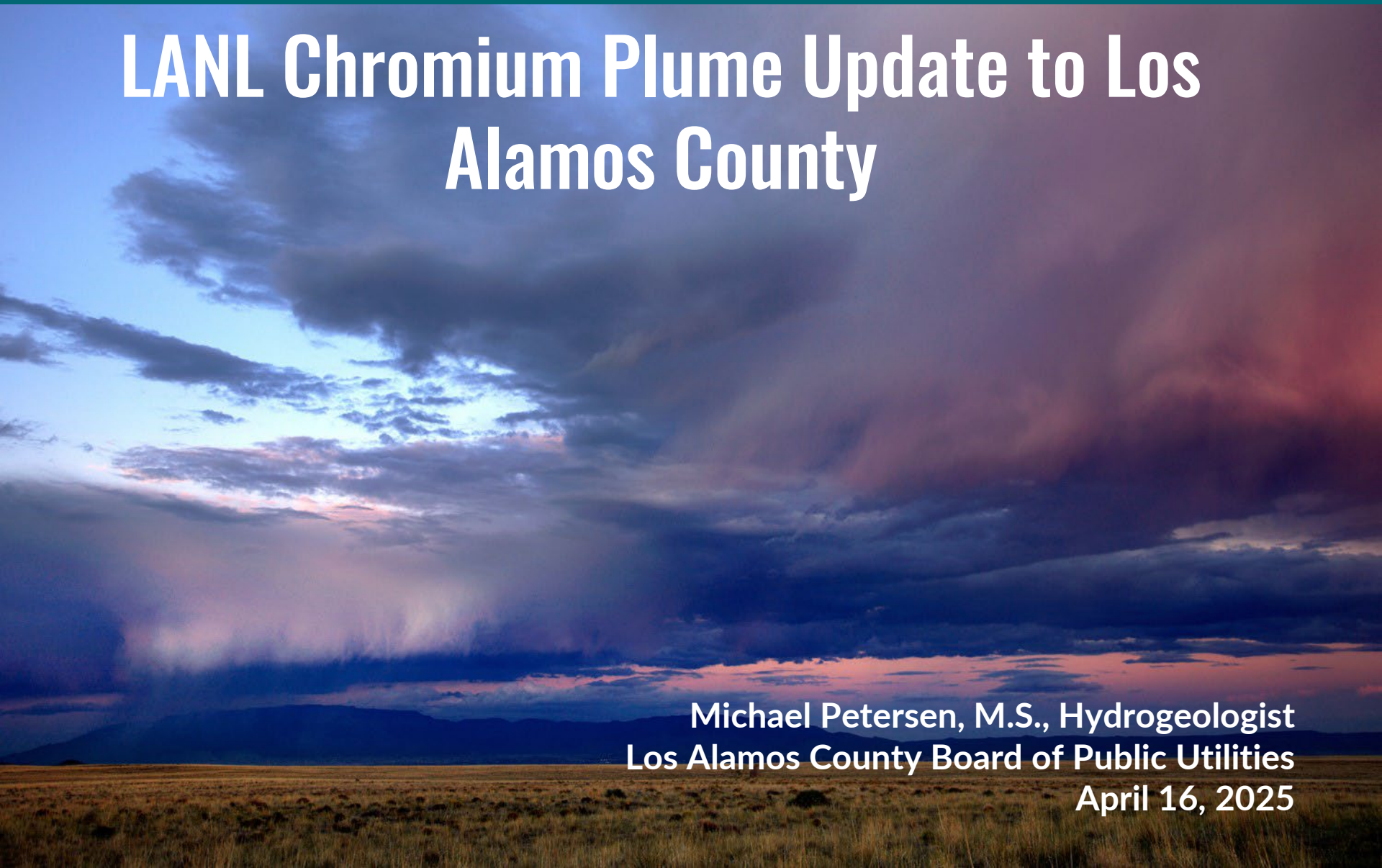
New Mexico Environment Department

LANL Chromium Plume Update to Los Alamos County



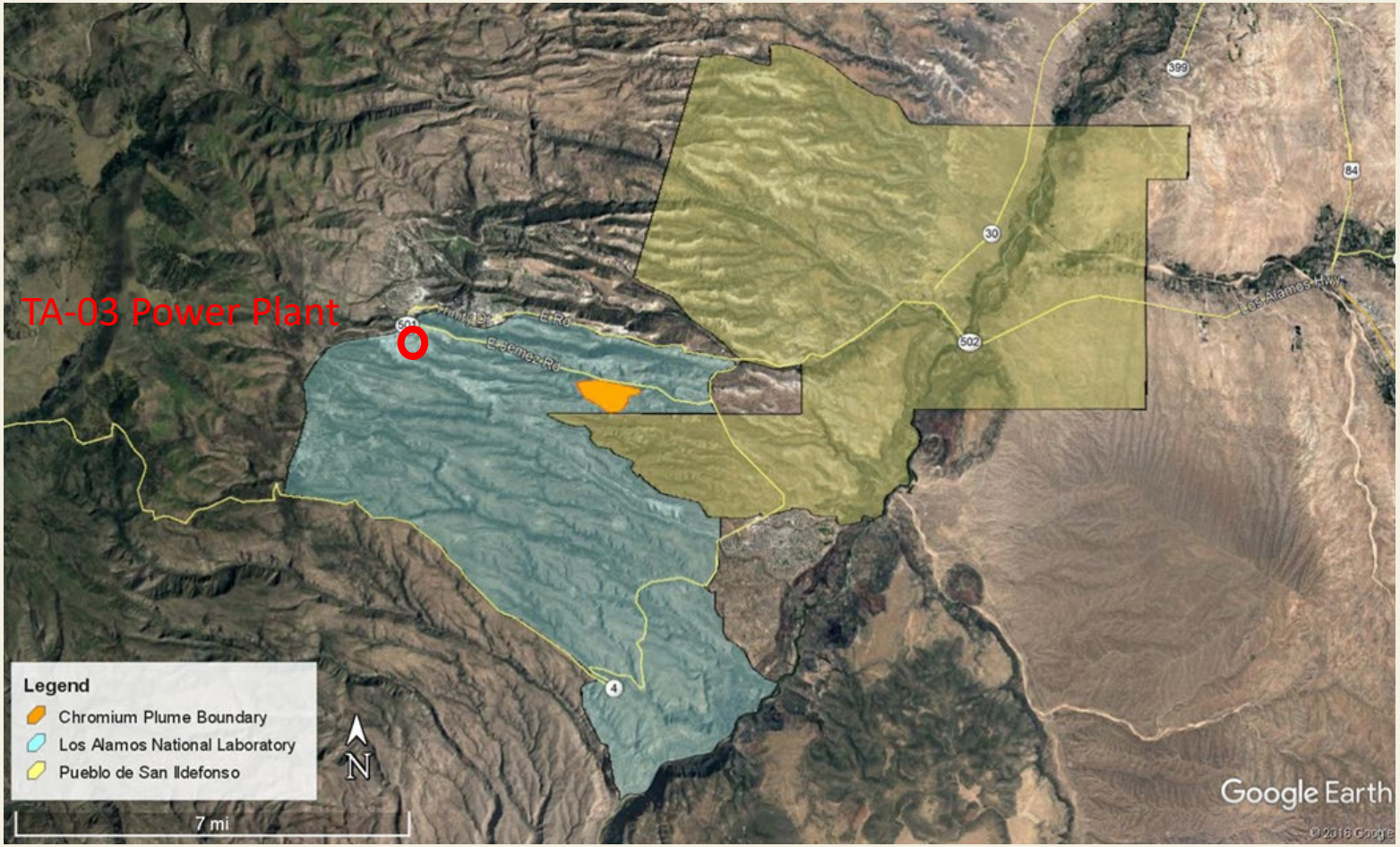
Michael Petersen, M.S., Hydrogeologist
Los Alamos County Board of Public Utilities
April 16, 2025

Outline

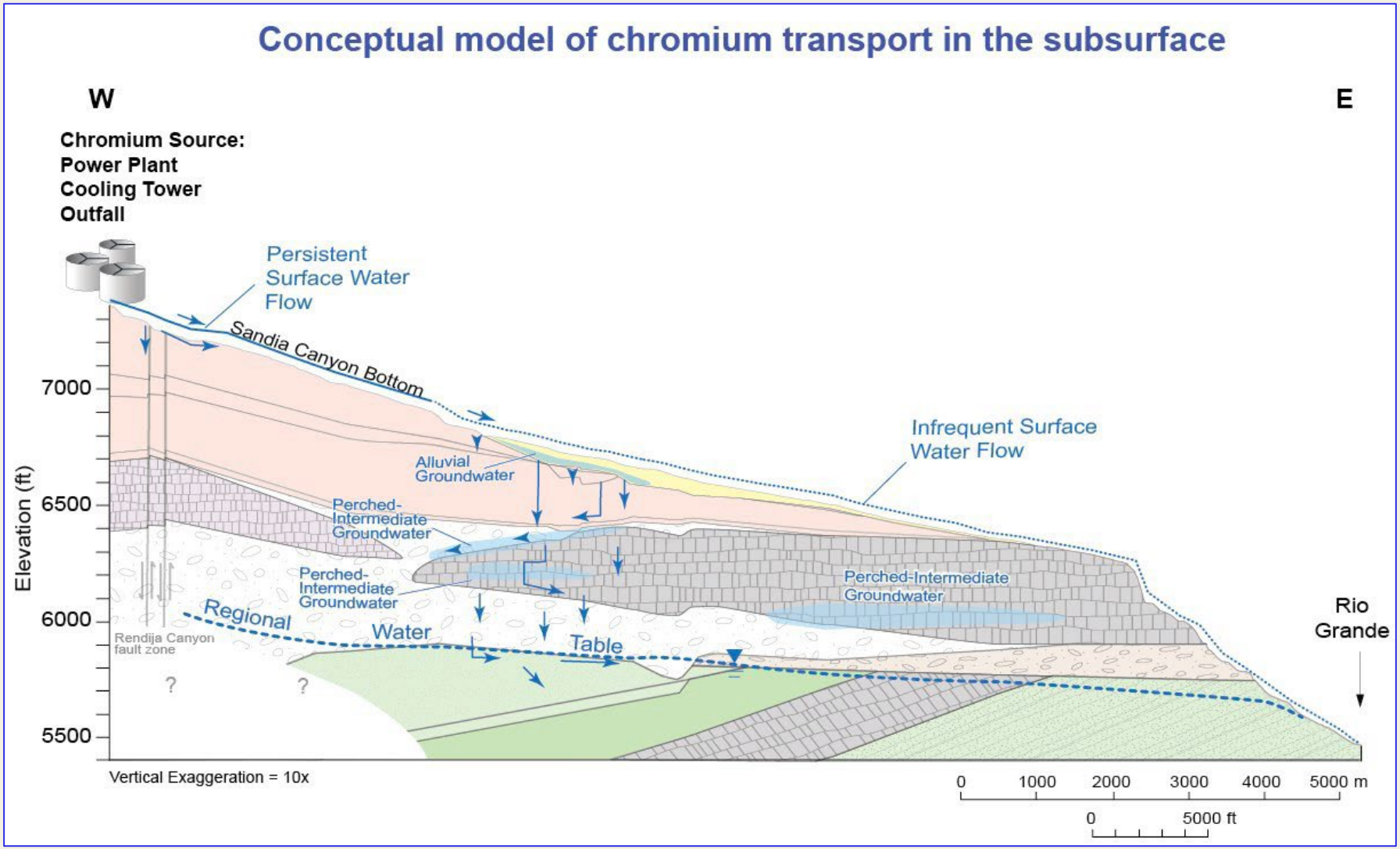
- Chromium source discussion
- Chromium interim measures updates
- New well priorities and areas of uncertainty
- Basic next steps
- Consent order updates

Chromium Source and Background

- Approximately 160,000 lbs. released to Sandia Canyon
- Potassium dichromate used to control corrosion in power plant cooling towers at TA-3 from 1956-1972.



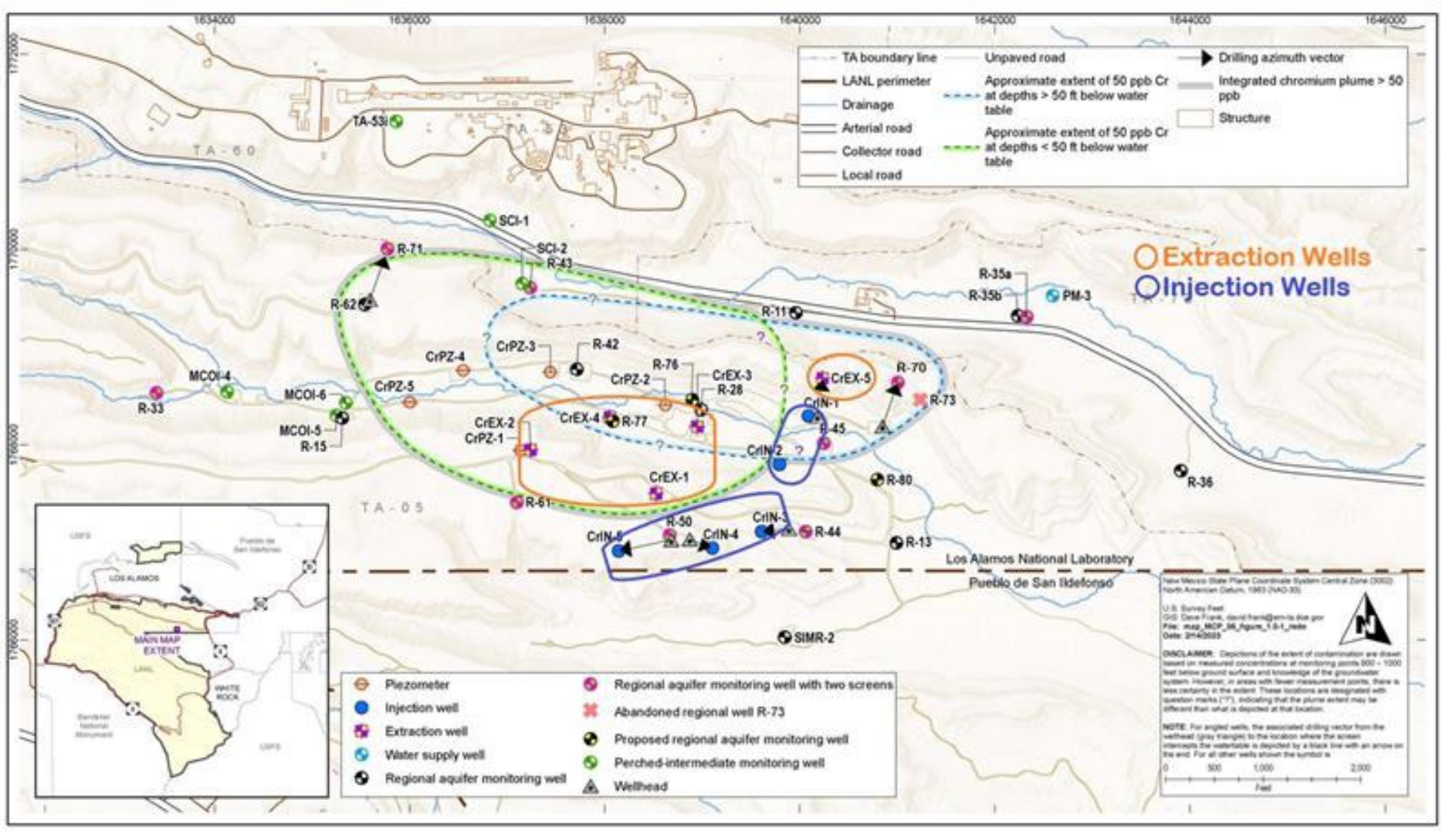
Chromium source and Background



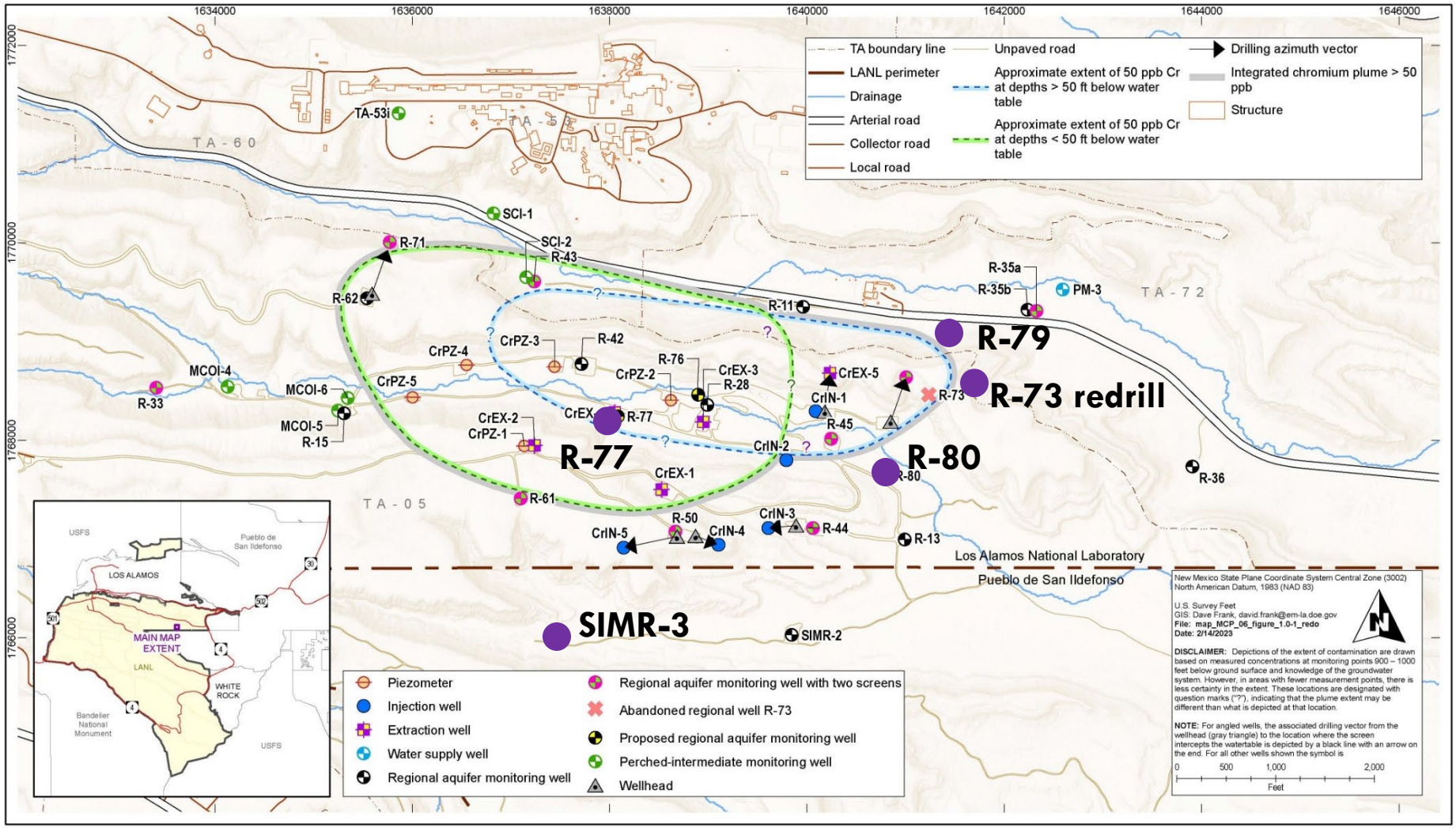
Key Updates Since Last Update

- Independent Technical Review
  - Many key recommendations that will require further discussion with DOE on implementation and prioritization
- IM partially restarted after first draft of ITR report delivered for factual accuracy review by NMED and EM-LA on September 30, 2024
  - Extraction wells: CrEX-2, CrEX-4, CrEX-5
  - Injection Wells: CrIN-3, CrIN-4, CrIN-5
- Revisions to 2016 Order on Consent
  - Finalized in September 2024

Chromium Plume Map and Interim Measures Infrastructure



Planned Data Gap Wells



Order on Consent Modifications

- NMED and DOE negotiated revisions on the Compliance Order on Consent (Consent Order)
  - Document that regulates the RCRA requirement for corrective action activities at LANL
  - Includes the remediation of the chromium plume
- Includes new dispute resolution procedures aimed at reaching resolution quicker
  - Old dispute resolution relied on the Parties reaching agreement or seeking judicial relief
  - New dispute resolution procedures are similar to the process used for this expert technical review

Order on Consent Modifications

- Technical disputes first attempt to find resolution between different tiers of management officials for each Party
- If negotiations are unsuccessful, the Parties agree to use an expert to resolve the technical dispute
  - Expert must be jointly agreed upon by the Parties
  - Cost must be shared equally between the Parties
  - Agrees to provide the expert with books, records, documents, information and personnel necessary to make informed decision
  - Expert shall issue a draft report and allow the Parties time to comment on the contents
  - Expert's decision is binding on the Parties

Proof of Concept

- Independent technical review followed the same procedures the modified Consent Order utilizes to resolve technical disputes
  - Jointly selected panel of experts, jointly determined scoping questions, information provided by both Parties, concludes with a recommendation aimed toward resolution
- Demonstrates successful participation between the Parties during the expert review
  - Ensures that the results and recommendations provided are independent
- Indicates that technical disputes can be resolved using an expert recommendation

Drilling Data Gap Priorities

- SIMR-3
  - Will inform potential contamination on Pueblo de San Ildefonso
- R-79 & R-80
  - Required by GWQB as part of the corrective action plan
  - Goal to further inform lateral and vertical extent of contamination in the north- and south-east region of the plume
- One monitoring well has been completed since January 2022
- Alternate injection source
  - Must have capacity for a minimum of 2 extraction wells
  - Not located within the extent of contamination
- R-73r & R-77
  - Goal to inform lateral extent to the east and vertical contamination in the centroid
- Additional wells may be required to define nature and extent as new well data is evaluated

Incorporating Key Recommendations

- Negotiating with DOE to determine a deadline on the interim measures workplan revision to incorporate the independent technical review recommendations
  - Alternative injection location to increase treatment capacity
  - FEHM model conversion to MODFLOW
    - Parameterization of aquifer properties like hydraulic conductivity, anisotropy, and storage
    - Incorporate local pumping
    - Location and rate of chromium mass flux to groundwater
  - Defining lateral and vertical extent
  - Vadose zone characterization
- Negotiating Appendix B for FY2026
  - Will provide the 3-year schedule for milestones for the chromium campaign
  - Due by July 31, 2025

Alternate Injection Locations

- Independent technical review recommendations evaluated 5 potential disposal options for the treated water
  - Repurposing PM-3 as a high-capacity injection
- Deep injection well construction
  - 1000-2000 ft deep, potentially screened below the Miocene basalt
- Surface water disposal
  - Pipe clean water back to the north and discharge into the alluvium
- Land Application
  - Could handle a fraction of the treated water
- Vadose Zone Injection Wells
  - Could use wells in the source area to flush contaminants out of the vadose zone
  - Complex and involves possibility for incomplete capture
- Spreading Basin

Questions?

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New Mexico Environment Department

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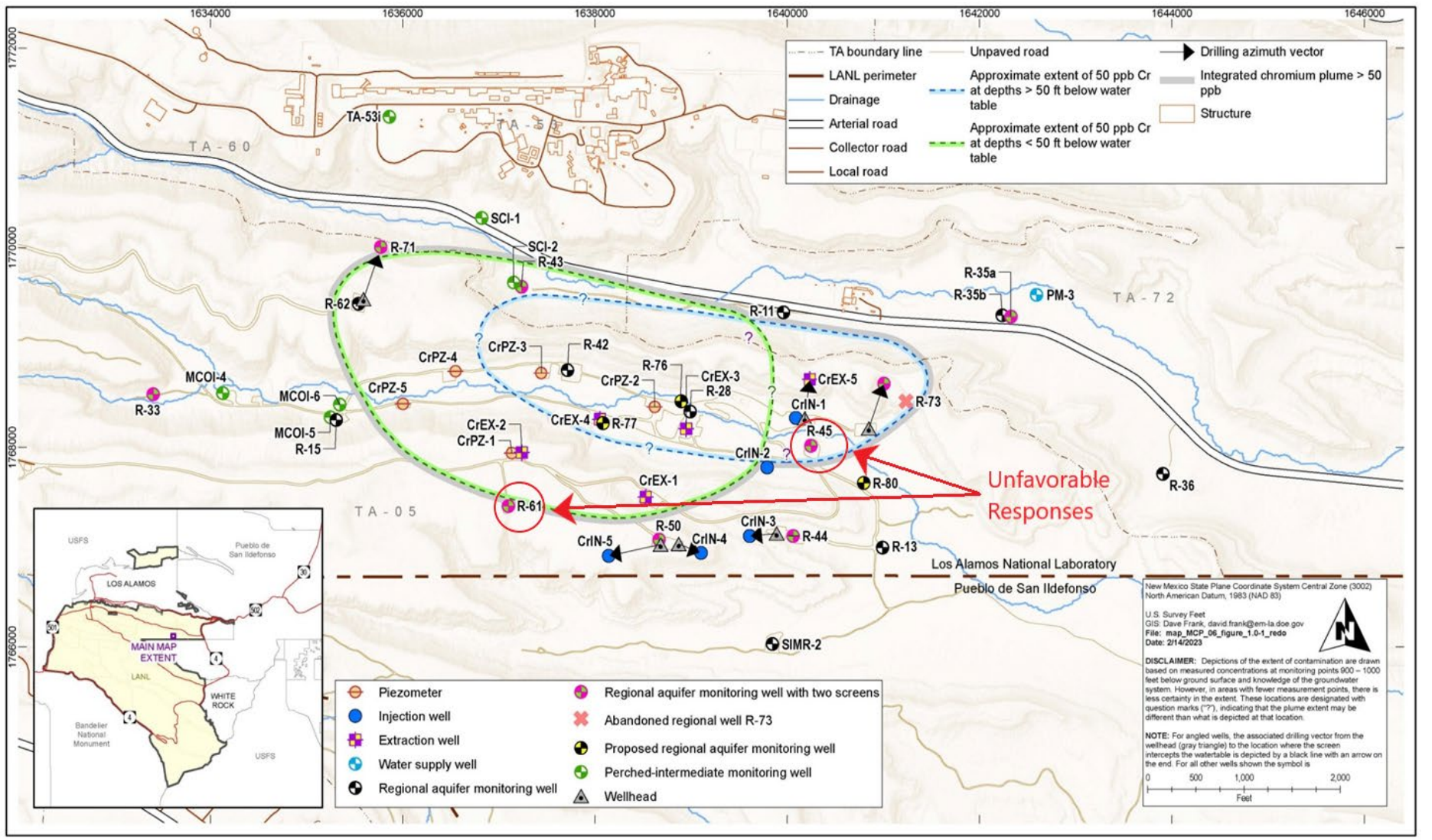
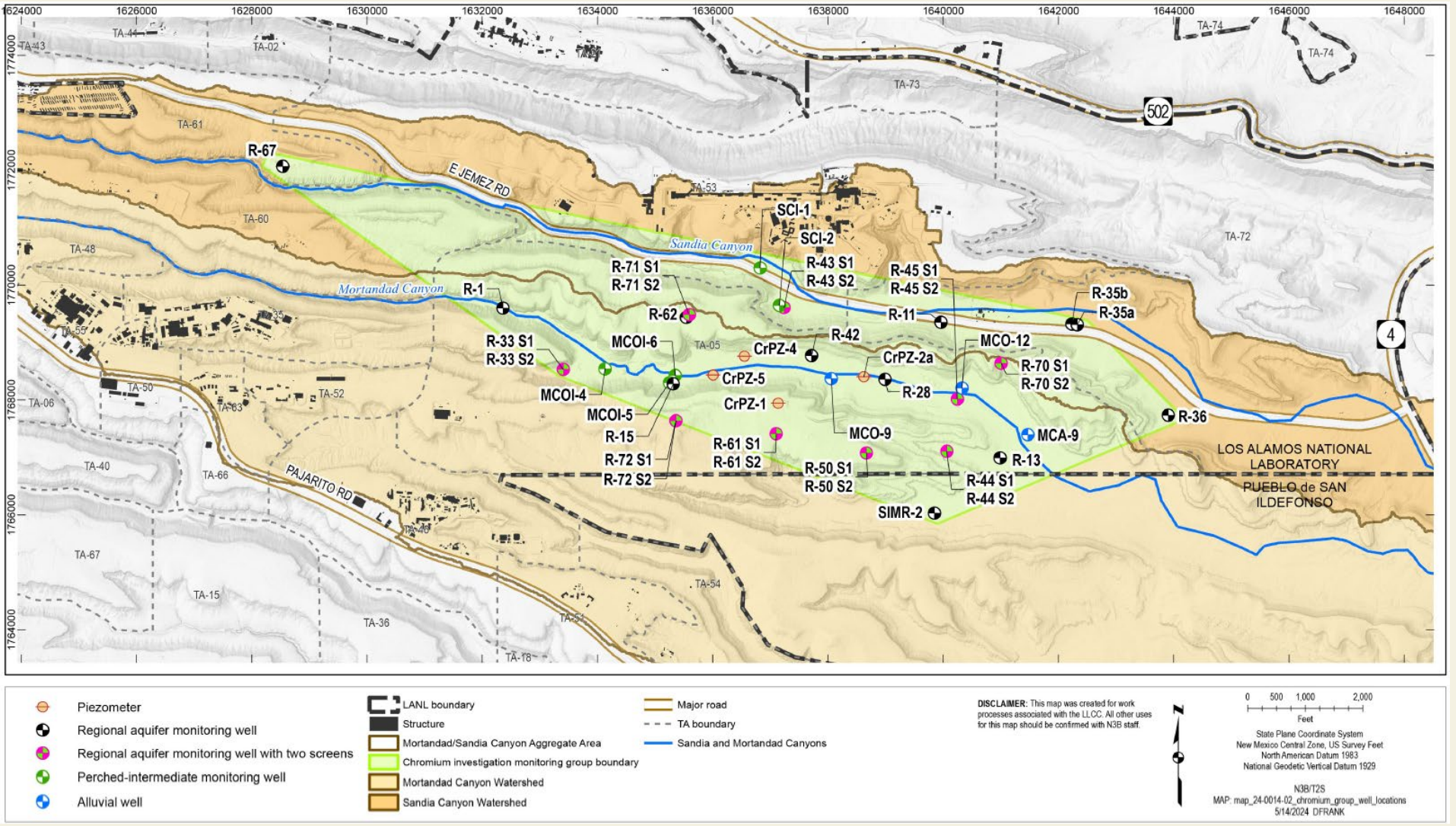
Mon. – Thurs. 7:30am – 5:30pm

Chromium Plume Map (reminder)



Existing Monitoring Wells



Piezometer
Regional aquifer monitoring well
Regional aquifer monitoring well with two screens
Perched-intermediate monitoring well
Alluvial well

LANL boundary
Structure
Mortandad/Sandia Canyon Aggregate Area
Chromium investigation monitoring group boundary
Mortandad Canyon Watershed
Sandia Canyon Watershed

Major road
TA boundary
Sandia and Mortandad Canyons

DISCLAIMER: This map was created for work processes associated with the LLCC. All other uses for this map should be confirmed with N3B staff.

0 500 1,000 2,000
Feet

State Plane Coordinate System
New Mexico Central Zone, US Survey Feet
North American Datum 1983
National Geodetic Vertical Datum 1929

N3B/T2S
MAP: map_24-0014-02_chromium_group_well_locations
5/14/2024 DFRANK