



# New Mexico Environment Department

## Hazardous Waste Bureau

Los Alamos National Laboratory Chromium Plume Cleanup

Rick Shean, Resource Protection Division Director

August 21, 2023

Radioactive and Hazardous Materials Interim Committee

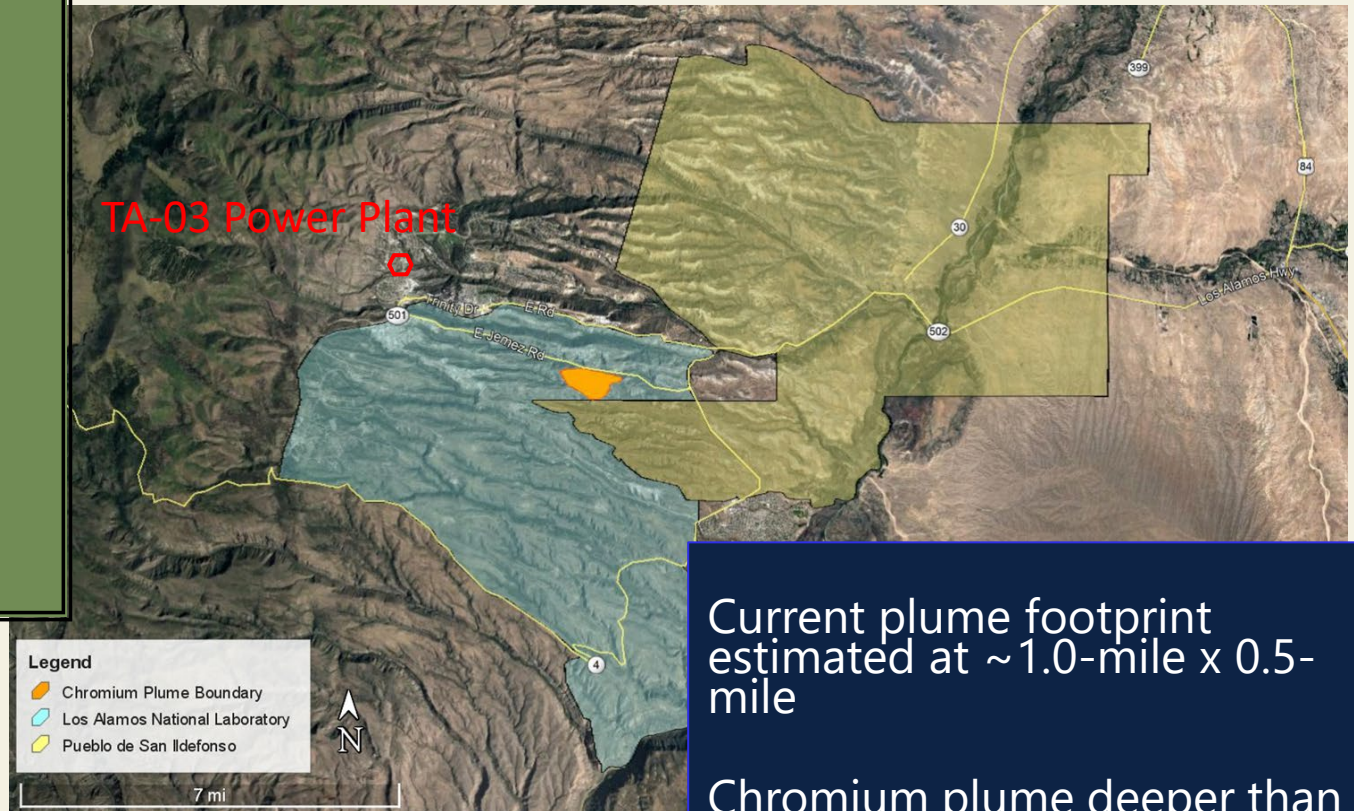


# Chromium Plume

Nearly 160,000 lbs. of chromium was released to Sandia Canyon from power plant cooling towers.

Discovered in regional aquifer in December 2005.

Full Nature & Extent of the contamination remains uncertain.



Current plume footprint estimated at ~1.0-mile x 0.5-mile

Chromium plume deeper than initial Conceptual Site Model (CSM)

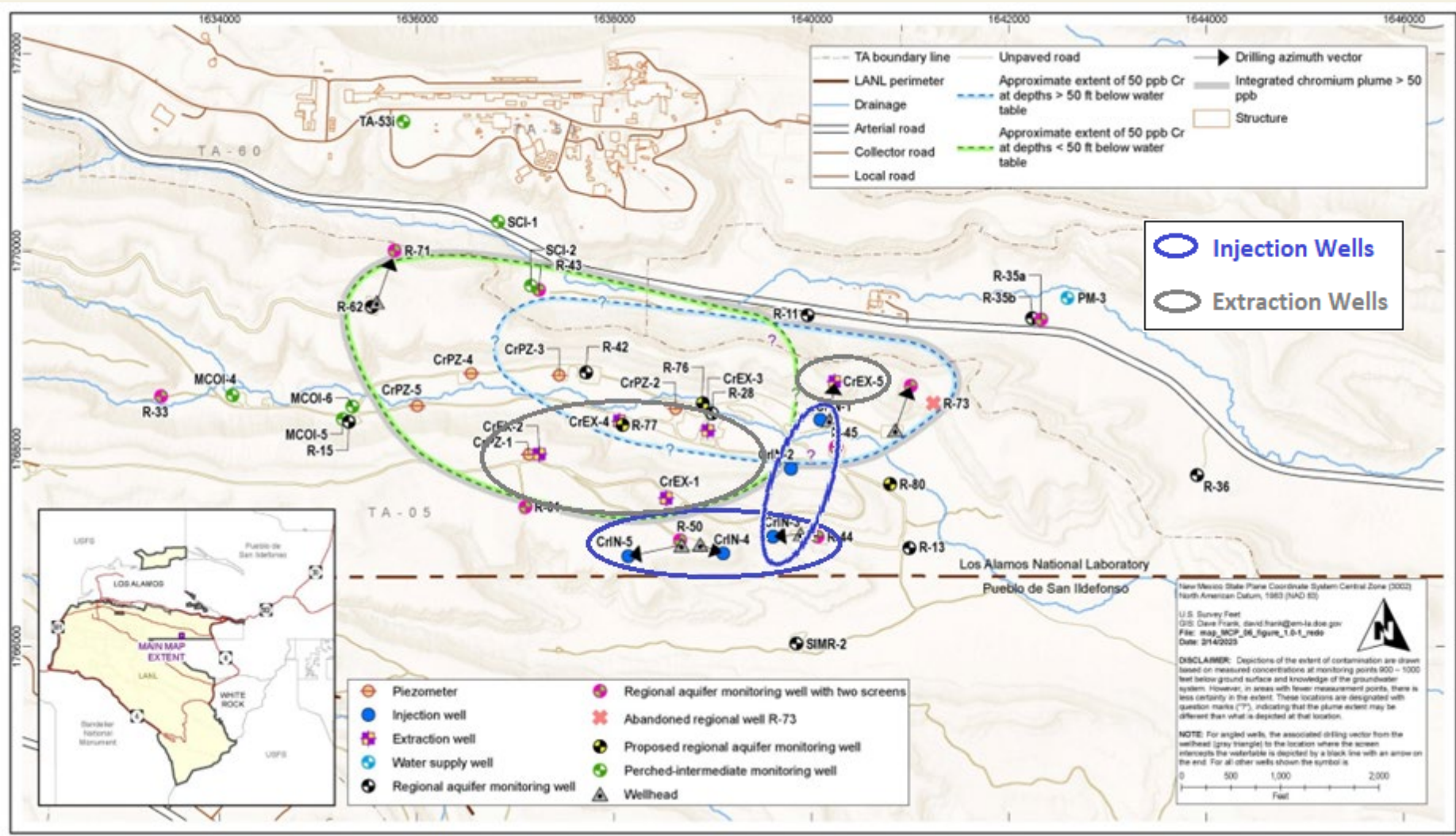


# Chromium Plume





# Chromium Plume





# Chromium Workplan

- DOE submitted the Chromium Interim Measures and Characterization Workplan (Workplan) in September 2022 per the litigated 2016 Consent Order
- NMED issued Notice of Disapproval (NOD) for the Workplan
  - ▣ We agreed with extraction, but required alternative location(s) for injection outside the plume contamination boundary



# Groundwater Permit

- We issued a groundwater permit on August 31, 2016 (Permit number: DP-1835).
- It covers five injection wells in the chromium plume area.
- It requires monitoring down-gradient wells for changes in plume dynamics.
- Data from late 2020 showed concentrations (55 ppb) **exceeding** state standards at deeper levels. Higher concentrations (up to 70 ppb) have been observed in this well screen.



# Notice to Cease Injection

- April 28, 2022: NMED notified DOE it was not in compliance with DP-1835.
- May 27, 2022: DOE refuted non-compliance and stated it would proceed.
- September 30, 2022: DOE proposed process for modeling the impacts of injecting the remediated water at the leading edge of the plume and install additional monitoring wells.



# Notice to Cease Injection

- December 12, 2022: GWQB issued DOE a letter requiring corrective action.
- We required DOE to cease injecting into all wells associated with DP-1835 by April 1, 2023.
- March 31, 2023: DOE ceased injection into the groundwater wells associated with DP-1835 and shuts down extraction and treatment as well.





# Next Steps

- NMED is responsible for ensuring DOE's selected remedy is protective of downgradient receptors and can achieve final cleanup objectives in a reasonable time frame.
- NMED will approve a remedy when the nature & extent of the plume is sufficiently characterized.
- NMED will support selecting a final remedy treatment once the information necessary to best protect human health and the environment is acquired.



# Next Steps

- DOE and NMED should prioritize an alternative means of disposal/disposition of treated water.
- DOE should identify alternative injection locations outside the plume boundary.



# February 2021



STATE OF NEW MEXICO

## Environment Department

**MICHELLE LUJAN GRISHAM, GOVERNOR**

James C. Kenney, Cabinet Secretary

Jennifer J. Pruett, Deputy Secretary

### **NEWS RELEASE**

*For Immediate Release*

**Feb. 25, 2021**

**Contact:** Maddy Hayden, Communications Director  
New Mexico Environment Department  
505.231.8800 | maddy.hayden@state.nm.us

*The Environment Department's mission is to protect and restore the environment and to foster a healthy and prosperous New Mexico for present and future generations.*

### **Environment Department files complaint against U.S. Department of Energy to speed clean-up of legacy waste, terminate 2016 Consent Order at Los Alamos National Laboratory**

*Non-compliance with 2016 Consent Order causing unacceptable delays, threatening public health and the environment*

**SANTA FE** — The New Mexico Environment Department (NMED) filed a civil complaint in First Judicial District Court against the U.S. Department of Energy (DOE) for failing to make progress on clean-up of contamination as required by the 2016 Compliance Order on Consent (2016 Consent Order) at Los Alamos National Laboratory (LANL). NMED found the DOE Los Alamos Field Office's 2021 Plan was inadequate due to a lack of substantive and appropriate clean-up targets for coming years.



# July 2023



United States Government Accountability Office  
Report to Congressional Committees

July 2023

## NUCLEAR WASTE CLEANUP

### DOE Needs to Address Weaknesses in Program and Contractor Management at Los Alamos

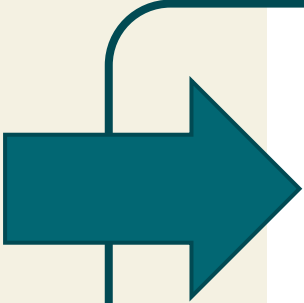
Accessible Version



# July 2023

## Recommendations for Executive Action

We are making the following six recommendations to the Department of Energy:



The Secretary of Energy should direct the EM-LA Field Office Manager to work—in conjunction with the New Mexico Environment Department—with a third-party facilitator to improve the relationship and build trust. (Recommendation 1)

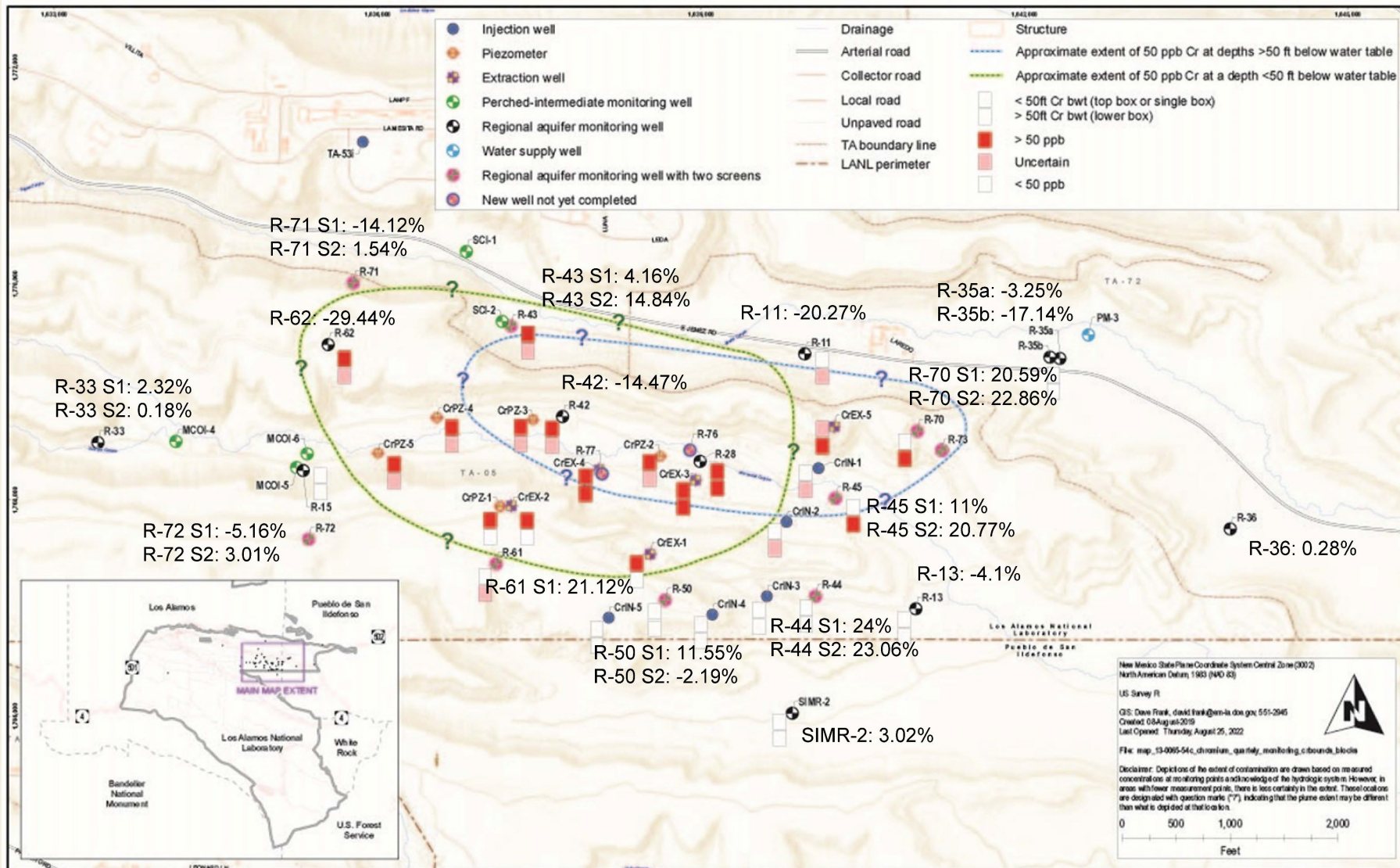
The Secretary of Energy should direct the Senior Advisor for the Office of Environmental Management to conduct a root cause analysis and develop and implement a corrective action plan to account for the increases in cost and schedule at EM-LA. (Recommendation 2)

The Secretary of Energy should direct the Senior Advisor for the Office of Environmental Management to develop guidance for its cleanup sites on how to incorporate GAO's essential elements of risk-informed decision-making when applying the prioritization schema referenced in EM's 2020 Program Management Protocol. (Recommendation 3)

The Secretary of Energy should direct the EM-LA Field Office Manager to formalize and document the decision rules it uses and the analyses it conducts to prioritize cleanup actions, as it waits for EM to issue guidance



# Map Showing Percent Increase





# Percentage Increase Details

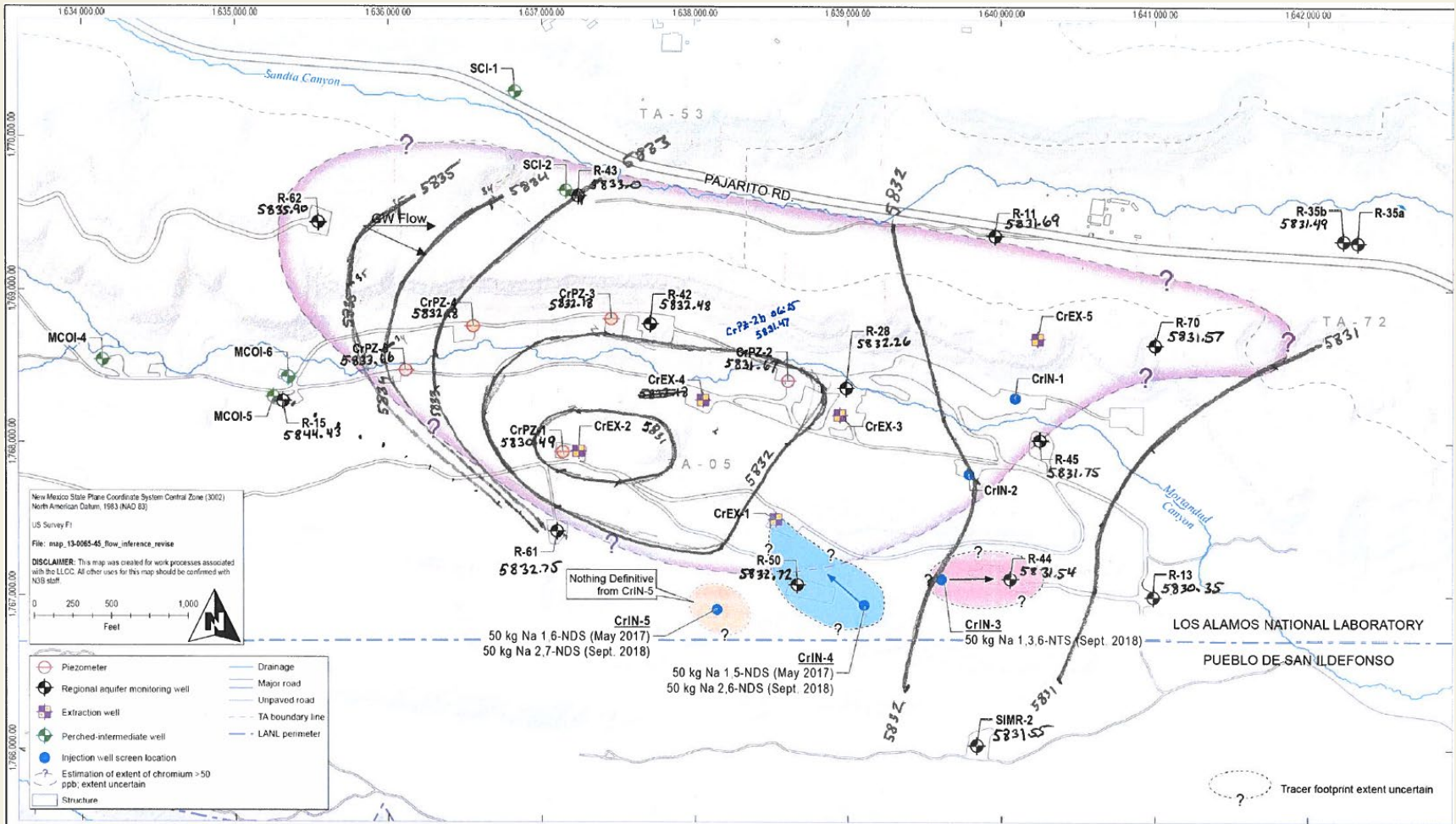
Monitoring Well	Percent Increase (+) or Decrease (-)	Last Detected Concentration (ppb)
R-33 Screen 1	2.32%	5.29
R-33 Screen 2	0.18%	5.61
R-43 Screen 1	4.16%	175
R-43 Screen 2	14.84%	32.5
R-44 Screen 1	24%	3.72
R-44 Screen 2	23.07%	7.95
R-45 Screen 1	11%	3.33
R-45 Screen 2	20.77%	56.4
R-50 Screen 1	11.55%	6.47
R-50 Screen 2	-2.19%	4.02
R-61	21.12%	60.8
R-62	-29.44%	254
R-70 Screen 1	20.56%	12.3
R-70 Screen 2	22.86%	172
R-71 Screen 1	-14.12%	3.65
R-71 Screen 2	1.54%	3.3
R-72 Screen 1	-5.16%	5.7
R-72 Screen 2	3.01%	5.47

Monitoring Well	Percent Increase (+) or Decrease (-)	Last Detected Concentration (ppb)
R-11	-20.27%	7.71
R-13	-4.1%	4.44
R-15	17.57%	17.4
R-35a	-3.25%	4.17
R-35b	-17.14%	4.64
R-36	0.28%	5.66
R-42	-14.47%	634.13
R-67	-1.3%	7.61
CrPZ-1	-46.25%	69
CrPZ-2	-13.38%	233
CrPZ-3	24.14%	468
CrPZ-4	82.02%	164
CrPZ-5	-5.74%	433
CrEX-1	2.92%	28.2
CrEX-2	41.14%	223
CrEX-3	87.29%	115
CrEX-4	16.26%	286
CrEX-5	72.48%	188
SIMR-2	3.02%	5.12



# Water Table Map – IM Operational, Synoptic Data

□ Water Level collected March 22, 2020, 03:00

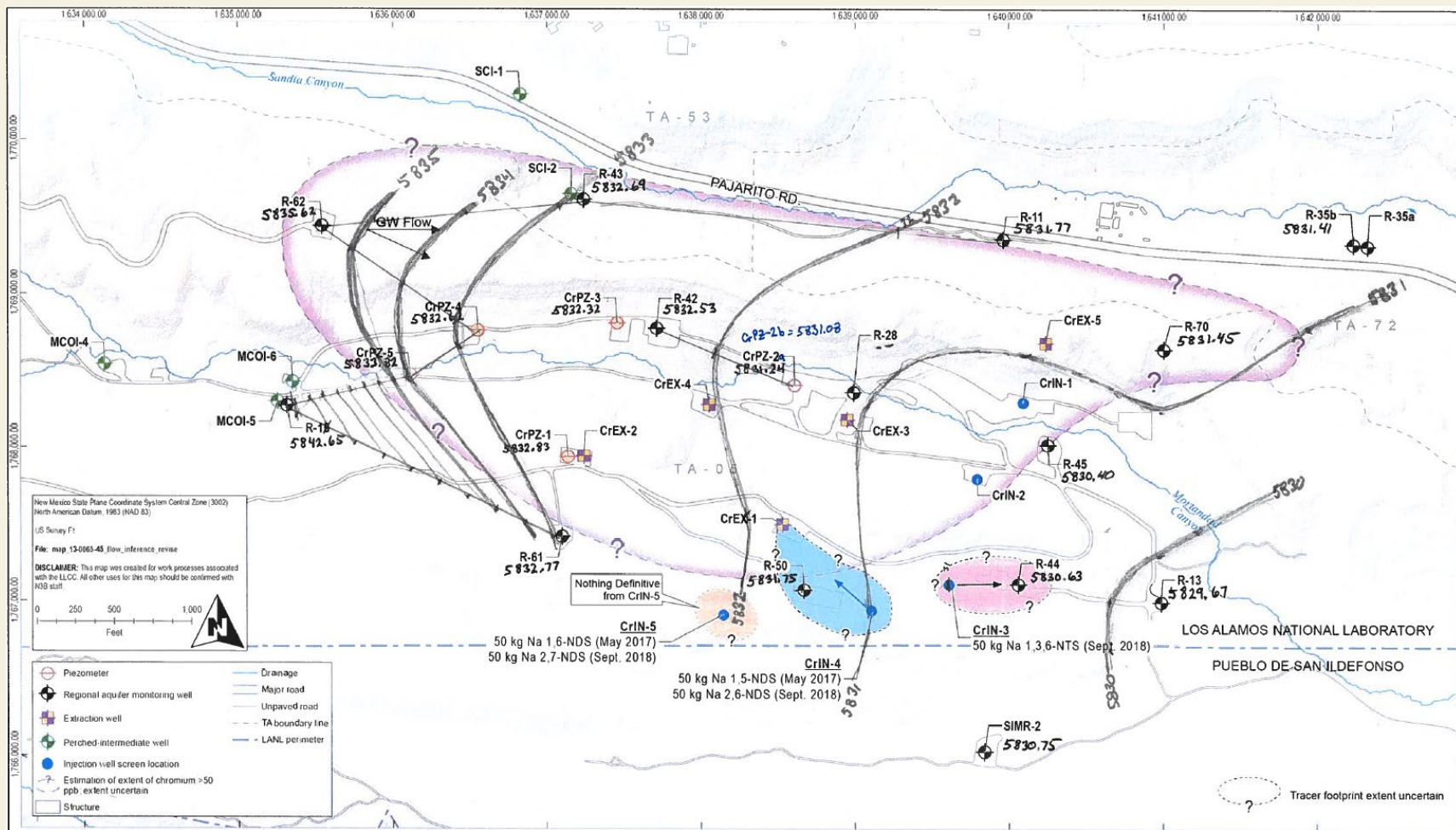






# Water Table Map – IM off, Synoptic Data

- Data Collected June 14, 2020, 03:00.
- Demonstrates response to IM being off during force majeure





# Water Table Map – IM Operational, 3-month averaged data

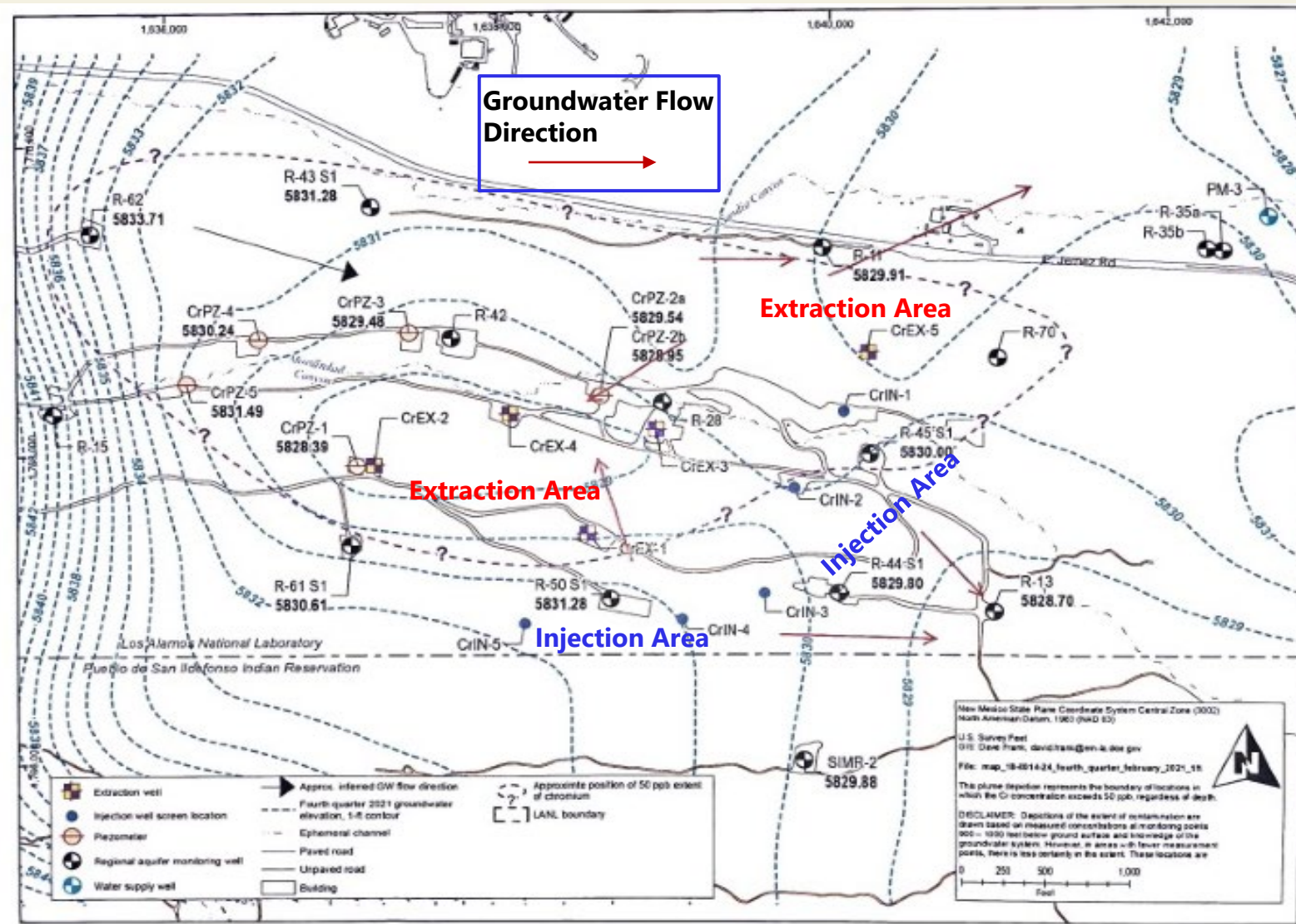


Figure 5.1-6 Potentiometric surface map to support DP-1835 for Quarter 4 2021. Red arrows are indicators of groundwater flow divide.