



U.S. DEPARTMENT OF
ENERGY

OFFICE OF
**ENVIRONMENTAL
MANAGEMENT**



Environmental Management Cleanup Forum

Sampling & How It Informs Cleanup

Presented by
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July 25, 2024





Legacy Cleanup Overview



- Groundwater monitoring & remediation
- Storm water management
- Surface/storm water sampling & controls



- Investigation and remediation of surface & subsurface contamination
- Remediation of Material Disposal Areas (MDAs)
- Off-site shipment of remediation waste (treatment & disposal)



- Above-ground transuranic (TRU) waste
- Below-ground TRU waste
- Low-level waste (LLW) & mixed LLW

Focus
Tonight





How Sampling Informs Decision Making

“Our robust sampling program helps verify the effectiveness of our legacy waste cleanup operations at LANL.”

Amanda White, N3B, Director, Environmental Remediation Water Program





“Our robust sampling program helps verify the effectiveness of our legacy waste cleanup operations at LANL.”

- ✓ Identifying nature and extent of contamination
- ✓ Determining risk
- ✓ Determining whether remediation is necessary – and the nature of such remediation
- ✓ Informing potential changes to remediation
- ✓ Confirming adherence to federal and state standards
- ✓ Receiving regulatory approval





Examples: Legacy Contaminants of Concern & Sources

Radionuclides

- Firing sites
- Operational and systematic releases
- Septic systems
- Waste-water treatment plants

High Explosives

- High explosives machining
- Firing sites
- Burn sites
- Septic systems

Polychlorinated Biphenyls (PCBs)

- Transformers
- Material disposal areas
- Septic systems

Copper

- Firing sites
- Surface disposal areas
- Septic systems

Lead

- Firing sites
- Burn sites
- Surface disposal areas

Zinc

- Firing sites
- Septic systems

Mercury

- Firing sites
- Waste-water treatment plants
- Coal-fired power plant

Silver

- Photo processing facilities

Groundwater Contaminants

- Hexavalent chromium
- Royal Demolition Explosives (RDX)
- Tritium
- Nitrate
- Perchlorate
- Sulfate





What N3B Samples

- Water – groundwater and surface water
- Soils
- Known disposal sites

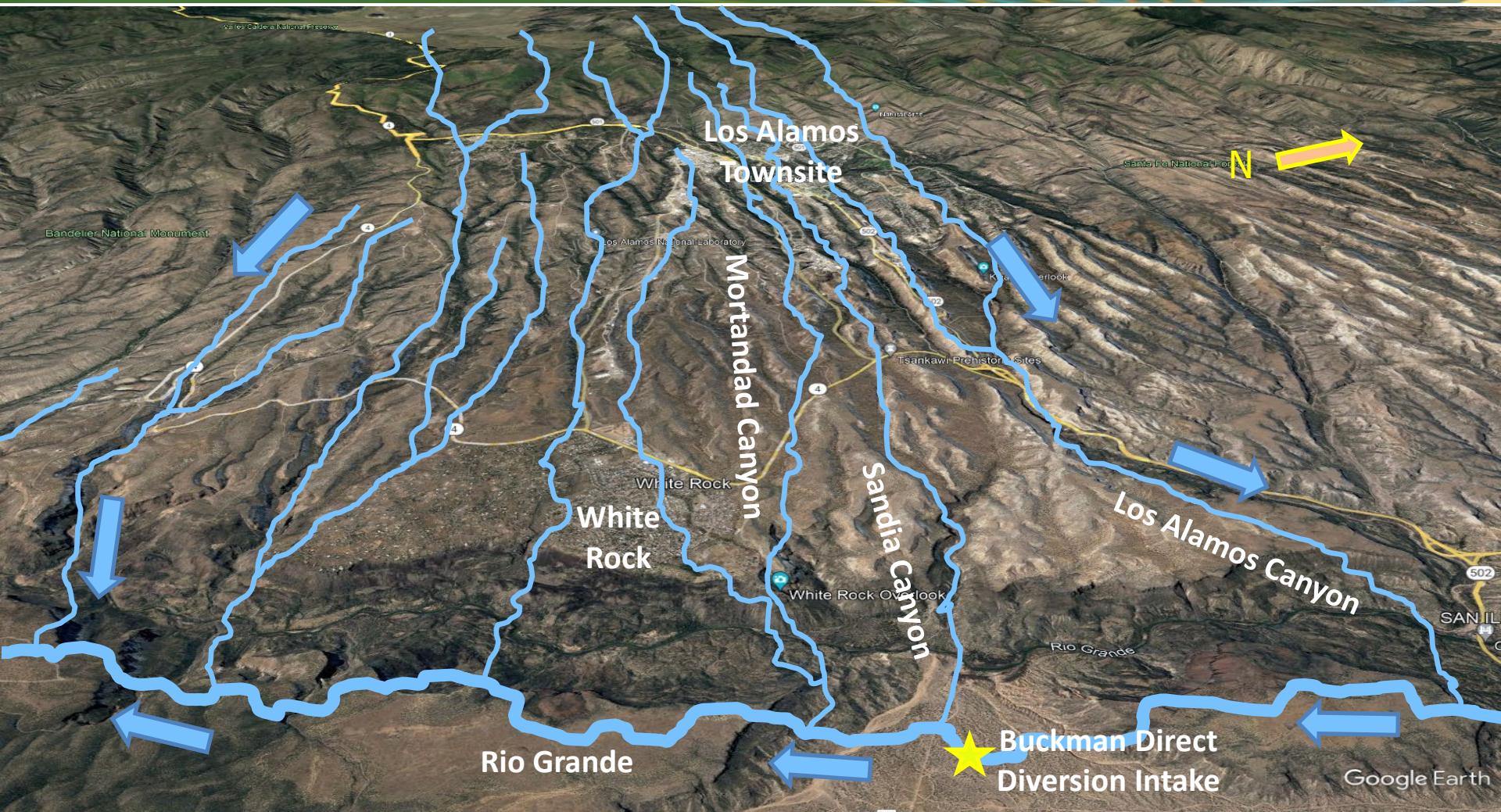




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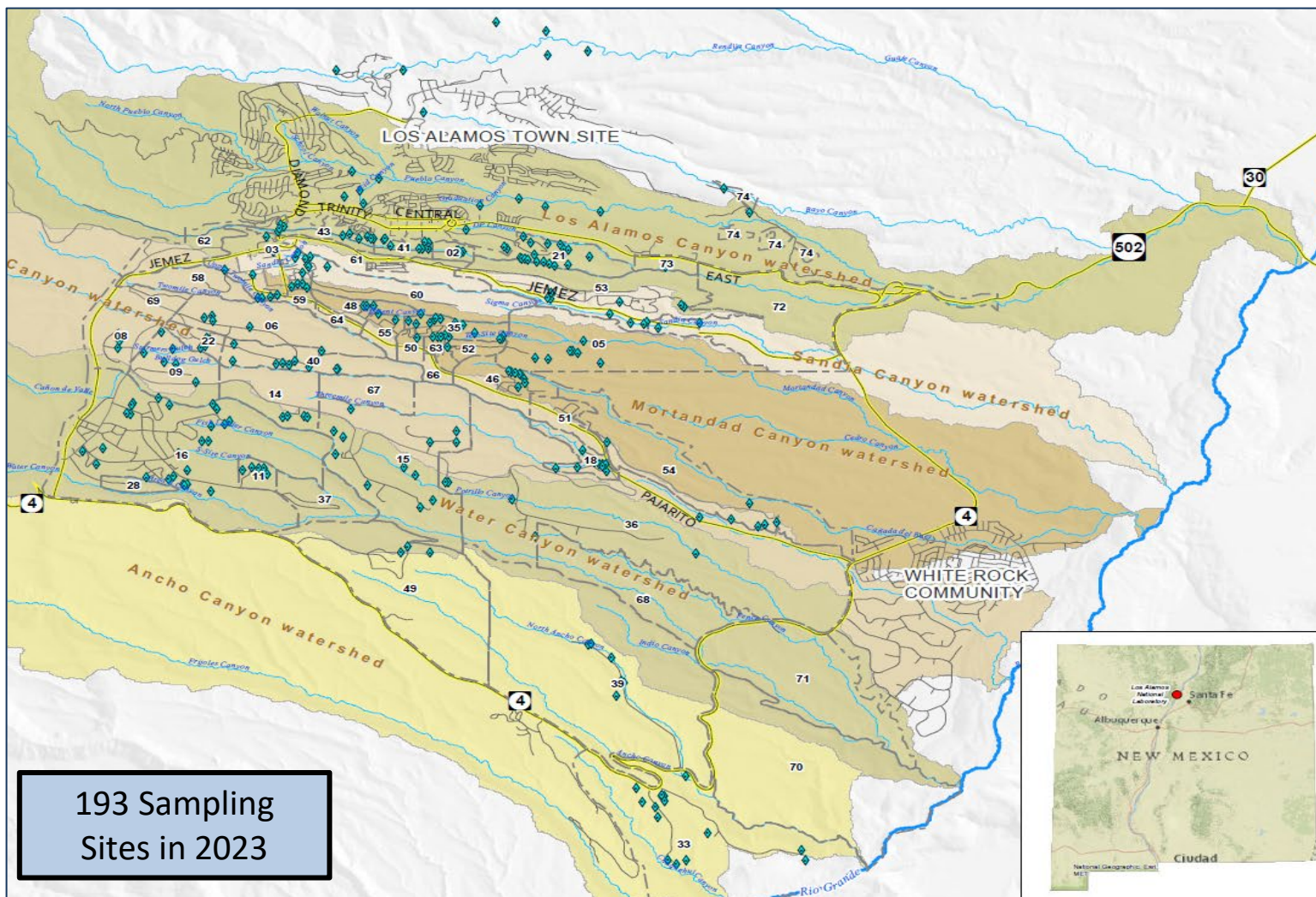
Surface Water: Flow Direction & Rio Grande



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Storm Water: Sampling Sites Across LANL



193 Sampling
Sites in 2023





Groundwater: Types of Monitoring Locations

Number of Groundwater Monitoring Locations by Type

Base Flow Sites	14
Springs	30
Alluvial Wells [1-60 ft below ground surface (bgs)]*	20
Perched-Intermediate Wells [100-800 ft bgs]*	41
Regional Aquifer Wells [900-1,200 ft bgs]*	98

* Range of depths to the respective water table





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Sampling Sites: Alluvial Wells



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Sampling Sites: Perched-Intermediate Wells



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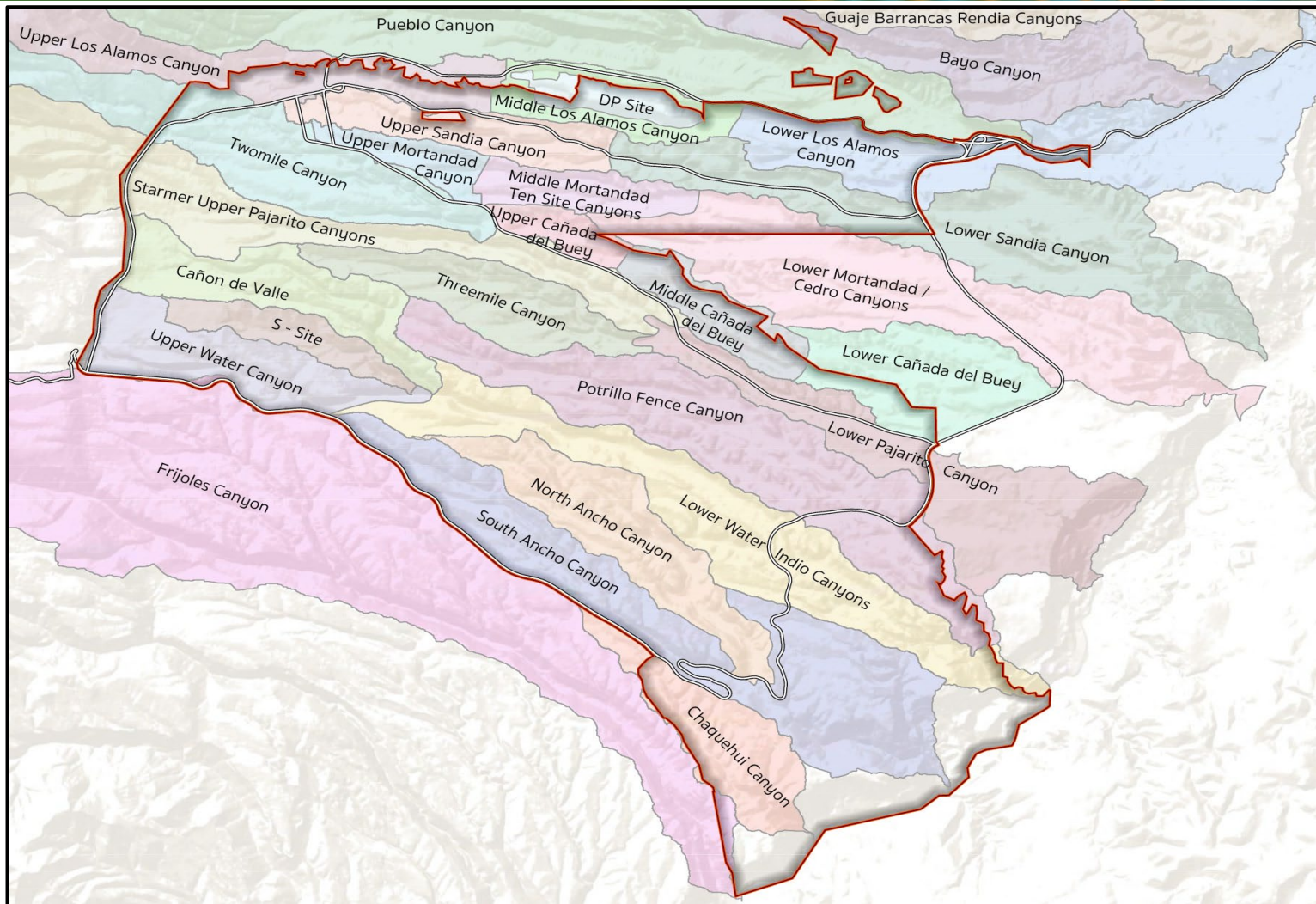
Sampling Sites: Regional Aquifer Wells



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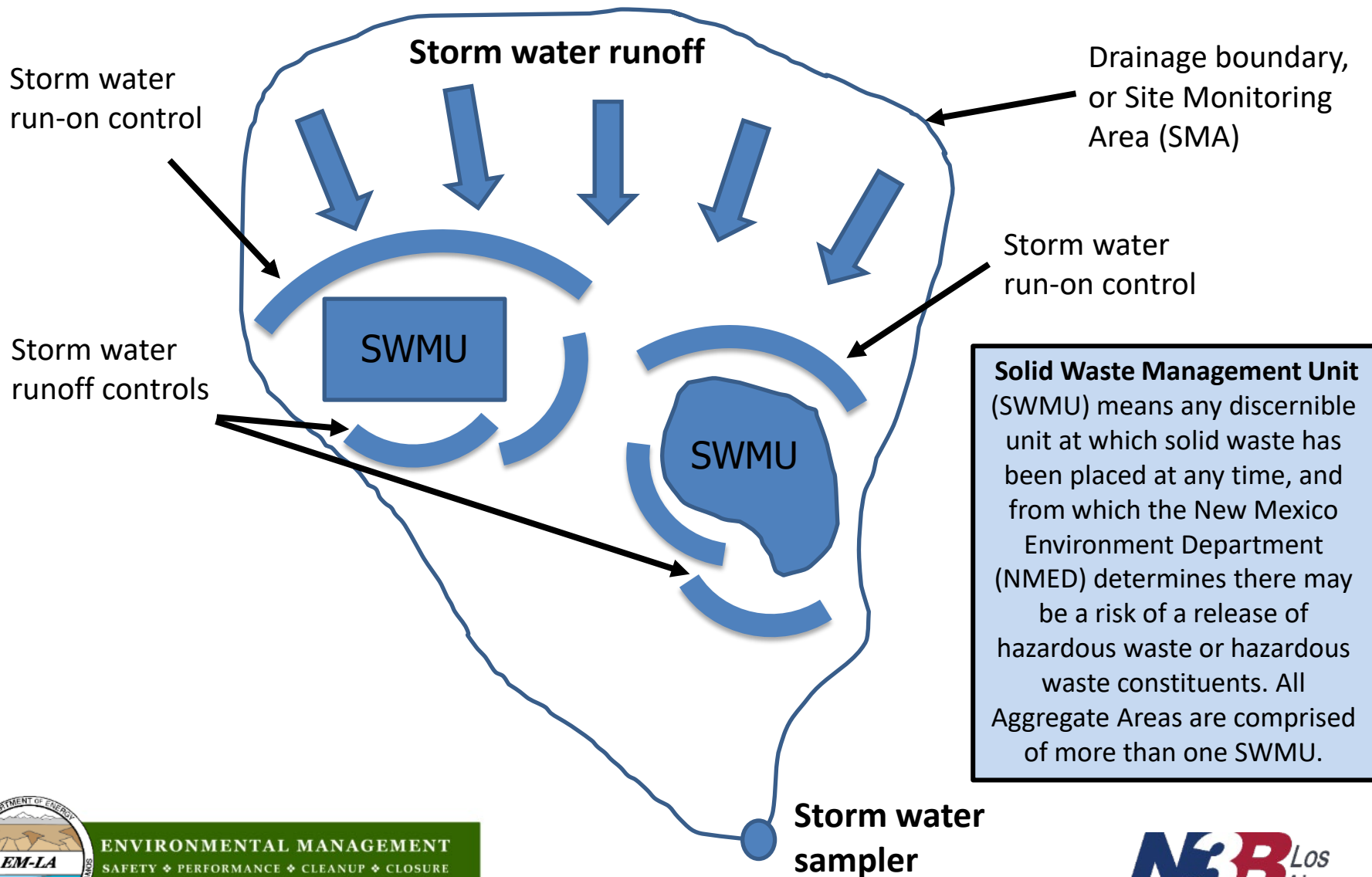


Aggregate Areas: Soil Sampling & Storm Water Runoff





Graphic Depicting Aggregate Area

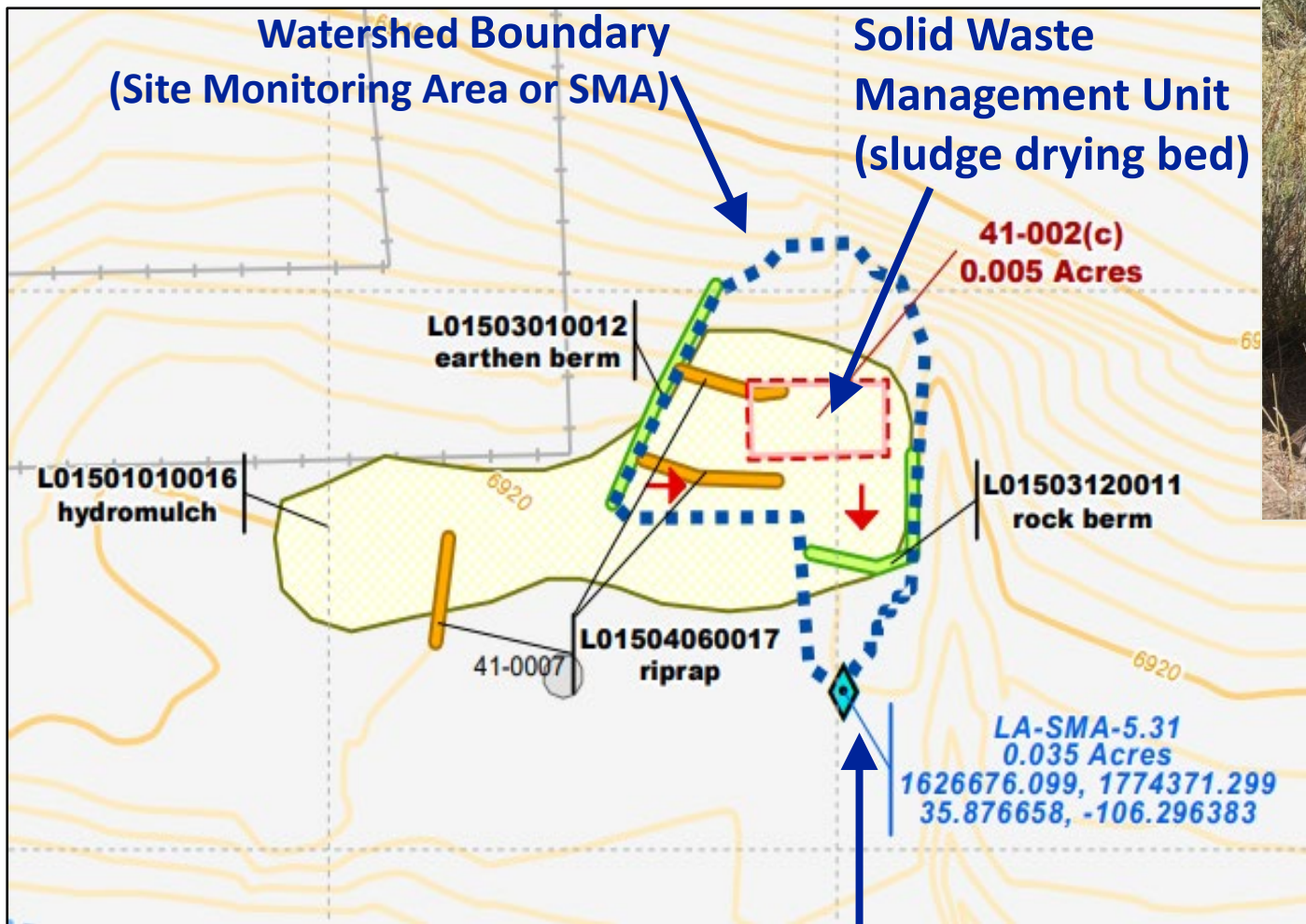




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Storm Water Controls at a SWMU



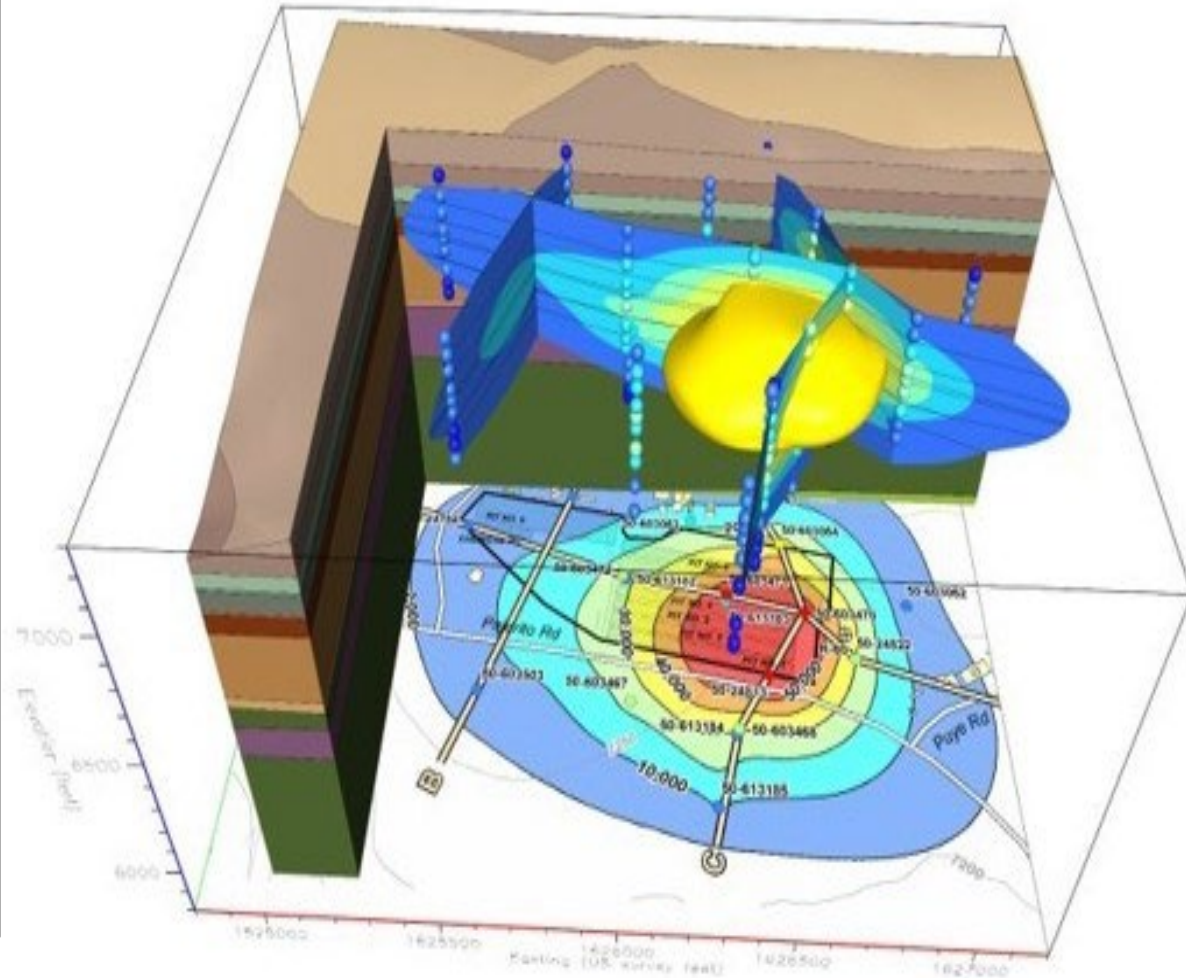
**Automated
Sampler**



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N3B conducts core and surface soil sampling to characterize nature and extent of contamination

- Vapor-phase contaminant monitoring (volatile organic compounds (VOCs) and tritium)
- Regional aquifer monitoring





Soil Sampling Summary

Process for...

- ✓ Characterization
- ✓ Risk Evaluation
- ✓ Remediation
- ✓ Regulatory Approval

...of SWMUs and Areas of Concern (AOC)

Area of Concern (AOC) means any area having a known or suspected release of hazardous waste or hazardous constituents that is not from a SWMU and that the Secretary of NMED has determined may pose a current or potential threat to human health or the environment.

Sample soils to...

1. Determine “nature and extent” of contamination
2. Once nature and extent are determined, calculate if applicable state and federal risk levels for human and ecological receptors are met
3. If not, use data to determine the remediation needed to meet applicable state and federal risk levels for human and ecological receptors
4. Following remediation, secure regulatory approval from NMED (called “Certificate of Completion”) for a SWMU or AOC under the Consent Order





Data: May 2018-June 2024

Storm water sample sites: 193 (current number)

Water samples collected: 22,770

Soil & sediment samples collected: 15,549

Vapor samples collected: 3,879

Google Earth





All sampling data is available through IntellusNM

<https://www.intellusnm.com/>

(public portal)

Documents & reports are in the Electronic Public Reading Room

- <https://eprl.lanl.gov/>
- <https://eprl.em-la.doe.gov/> (cleanup documents May 2018 – current)

The volume and detailed, technical nature of the data can be overwhelming. To help with public understanding, LANL offers courses on conducting research via IntellusNM.

