Update on Sandia/Mortandad Canyons Groundwater Investigation

Presentation for the

Northern New Mexico Citizens' Advisory Board

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Environmental Programs Directorate

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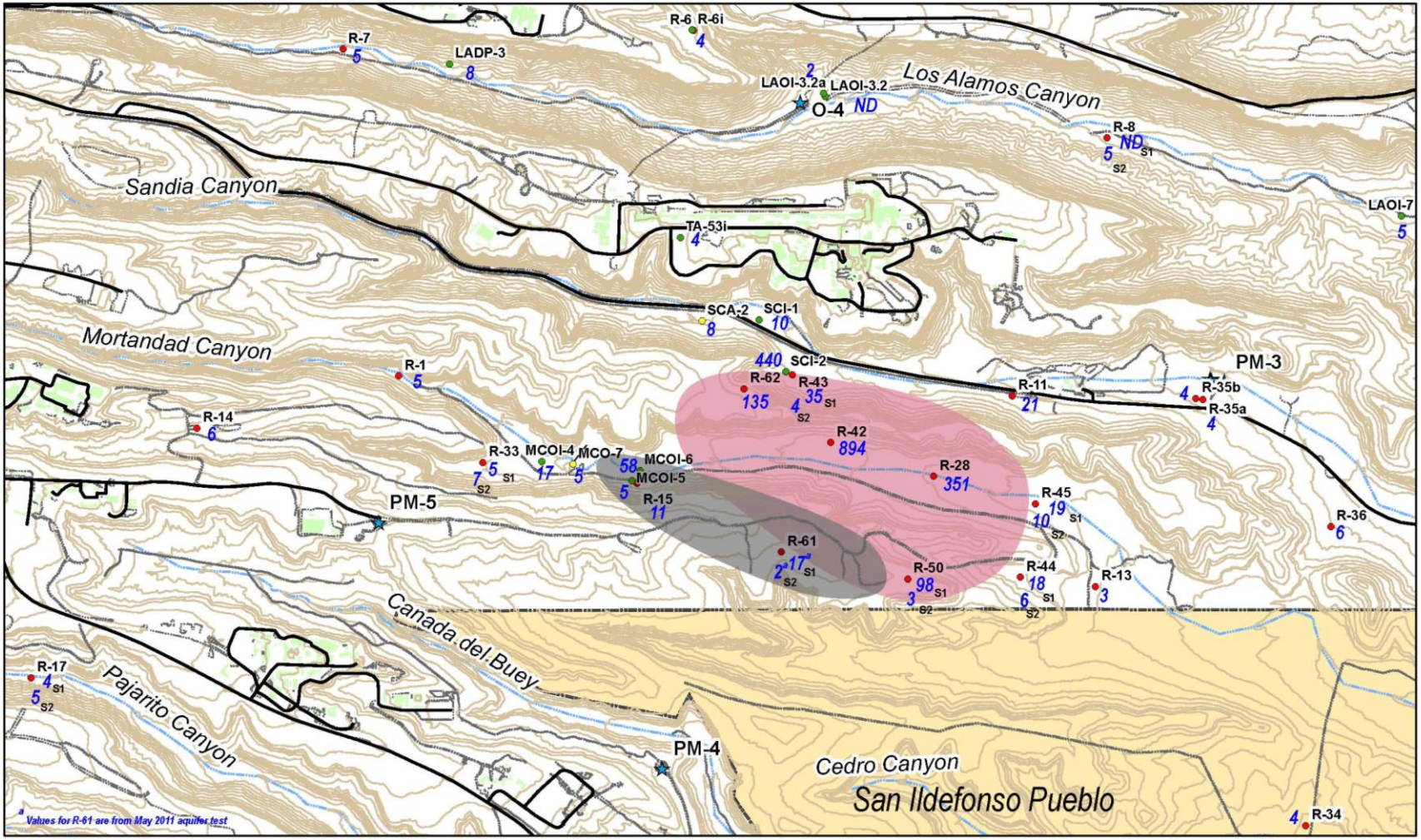
LA-UR-12-24913

Presentation Overview

- **Groundwater Contamination**
  - What contaminants
  - Footprint
- **Conceptual Model for Plume Evolution**
  - Source
  - Pathway
- **Path Forward**
  - Reports
  - Actions
  - Schedule

Chromium and Perchlorate Plumes

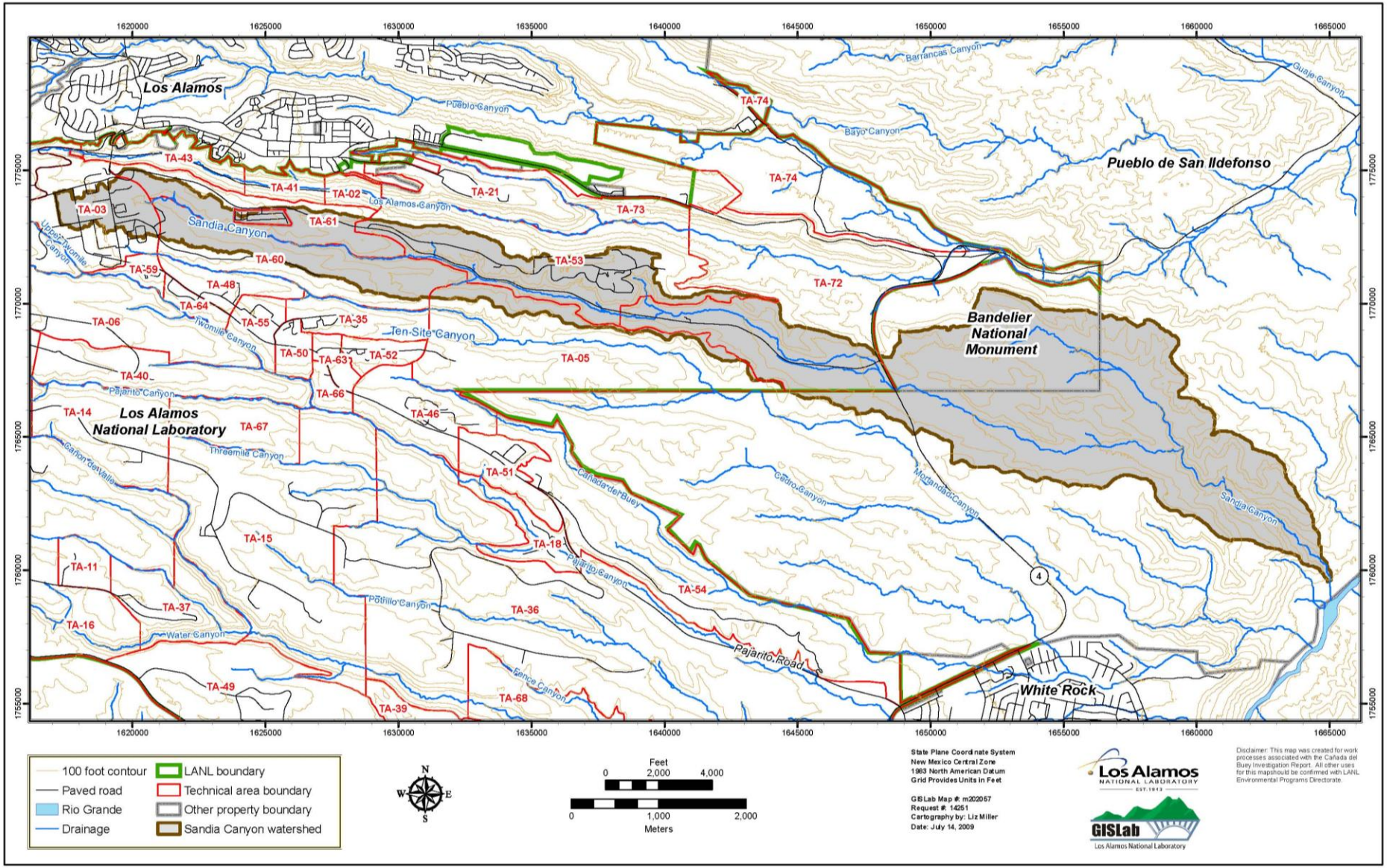


Investigation History

Two primary phases of investigation

- **Phase 1 2006-2009**
  - Sediment investigation
  - Biota investigation
  - Risk assessment for surface – recreational scenario
  - Perched-intermediate and regional monitoring wells
  - Geochemistry
  - GW modeling
- **Phase 2 2010-present**
  - Additional monitoring wells
  - Additional sediment investigation
  - GW modeling

Sandia Canyon Watershed



Sources of Contamination

Interviews and archival research

Sandia Canyon

- Potassium chromate (hexavalent Cr) used as corrosion inhibitor at TA-03 power plant in Upper Sandia Canyon
- 31,000 – 72,000 kg released to the canyon in effluent from 1956 – 1972

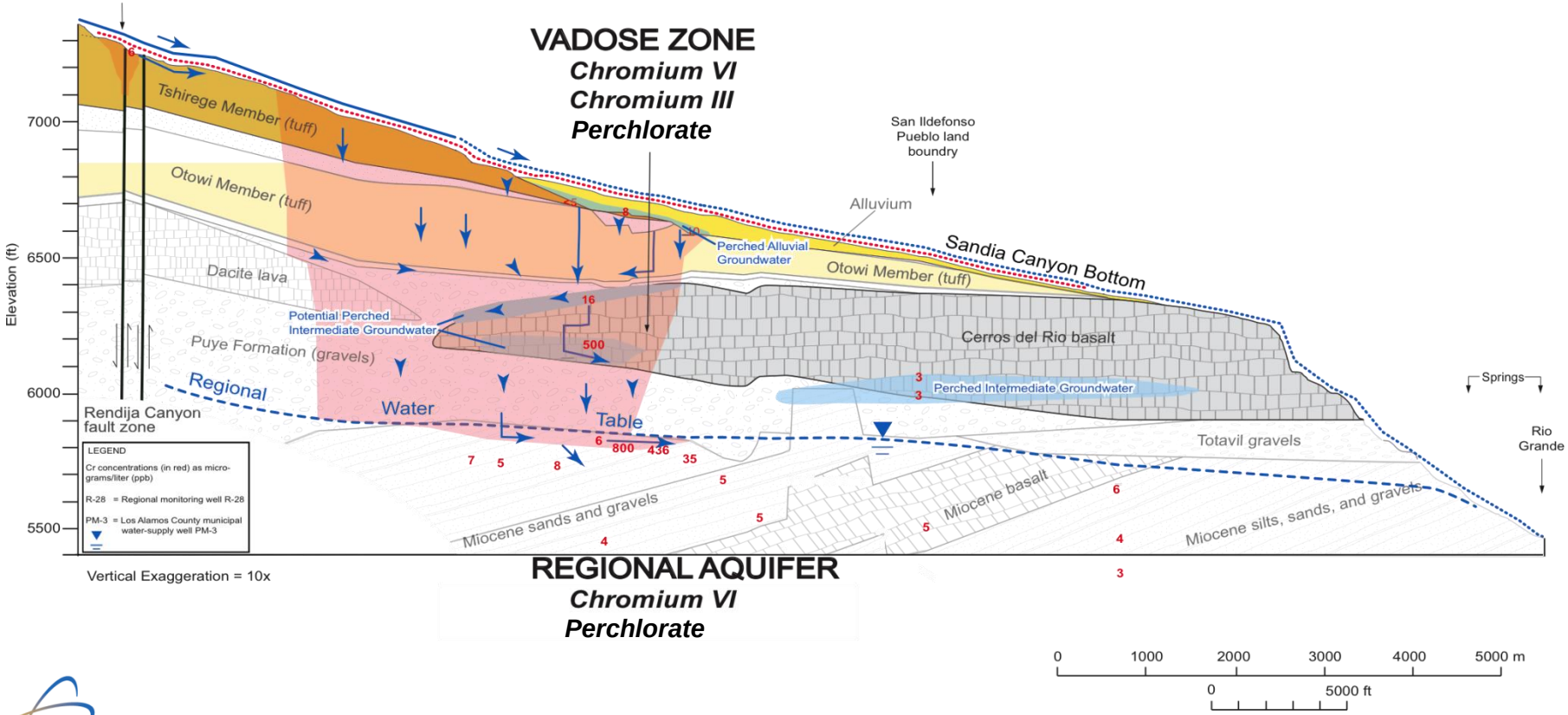
Mortandad Canyon

- Perchlorate released from radioactive wastewater treatment facility until ~2002
- Total amount not quantified

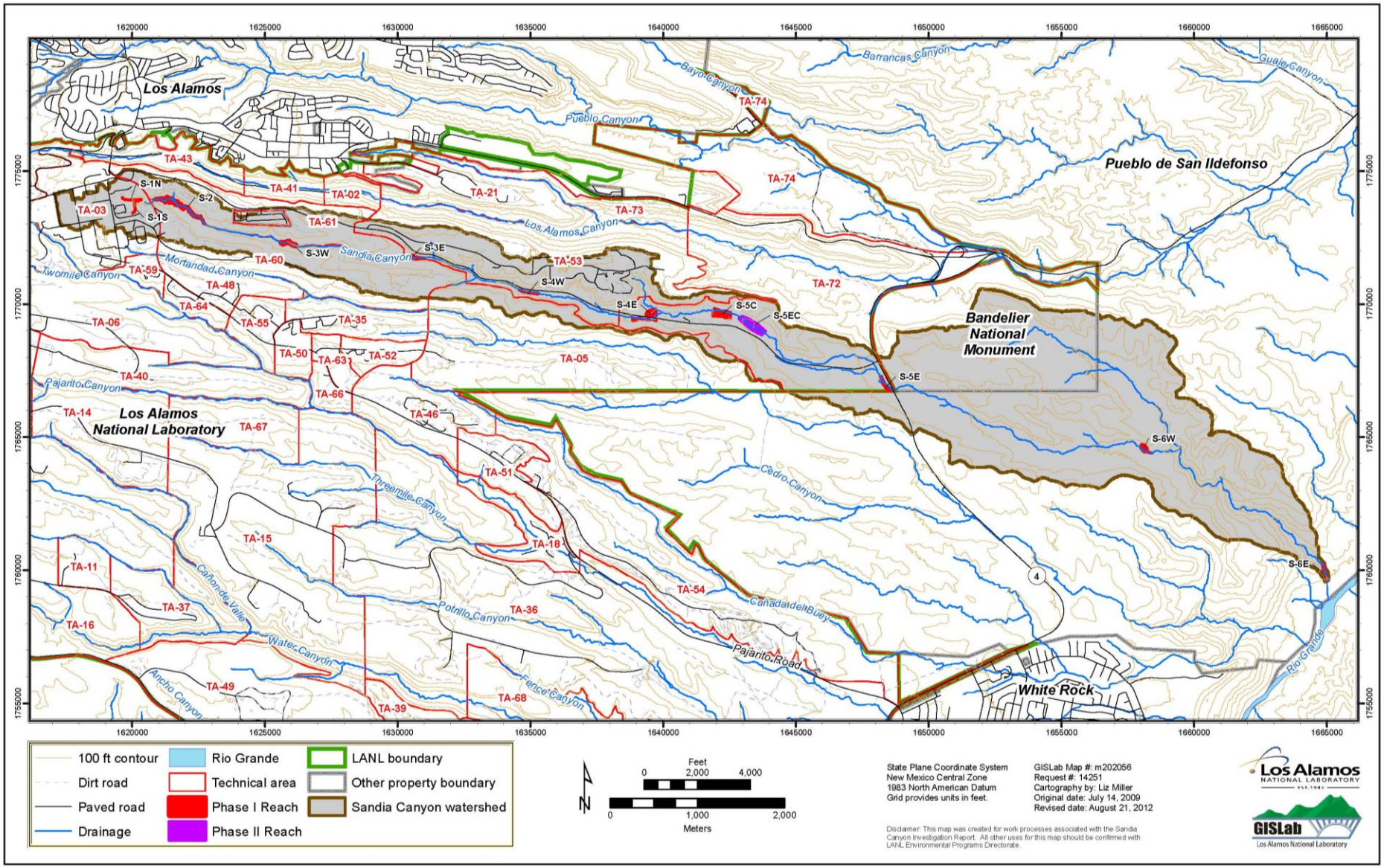
Distribution of Contaminants

WETLAND AND SURFACE SEDIMENTS

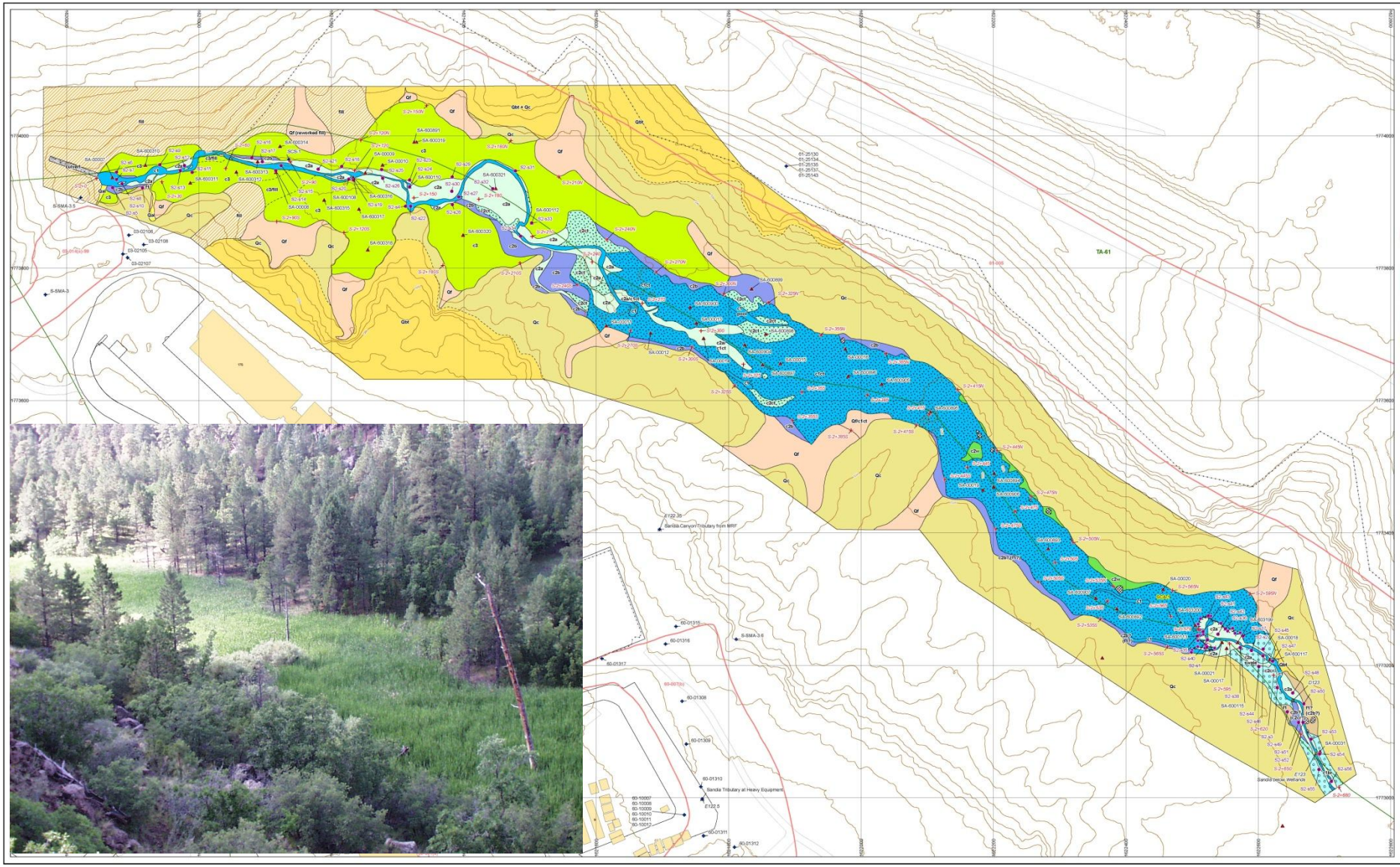
PCBs
Chromium III
Minor Chromium VI



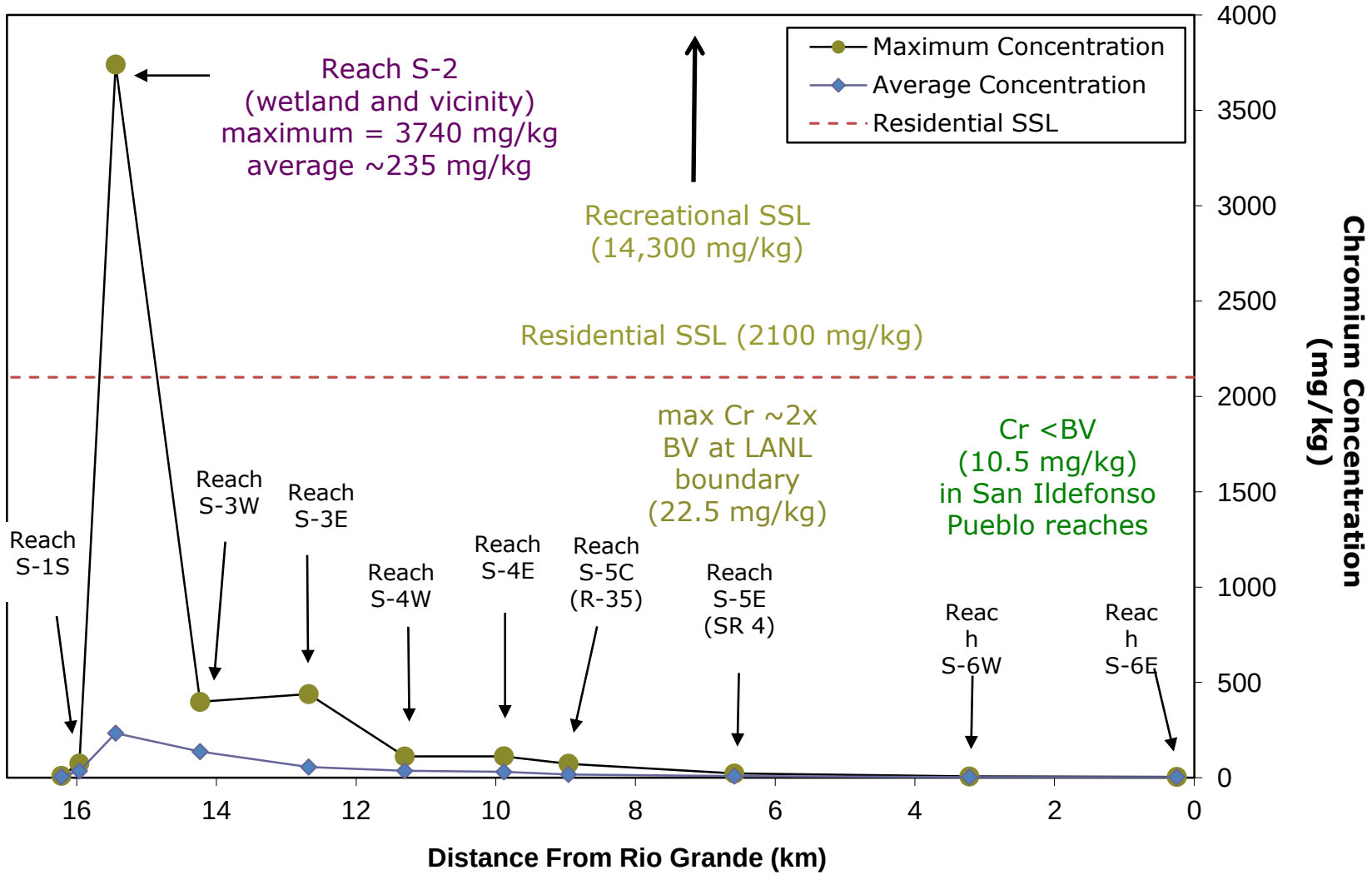
Sediment Investigation



Geomorphology of Sandia Wetland

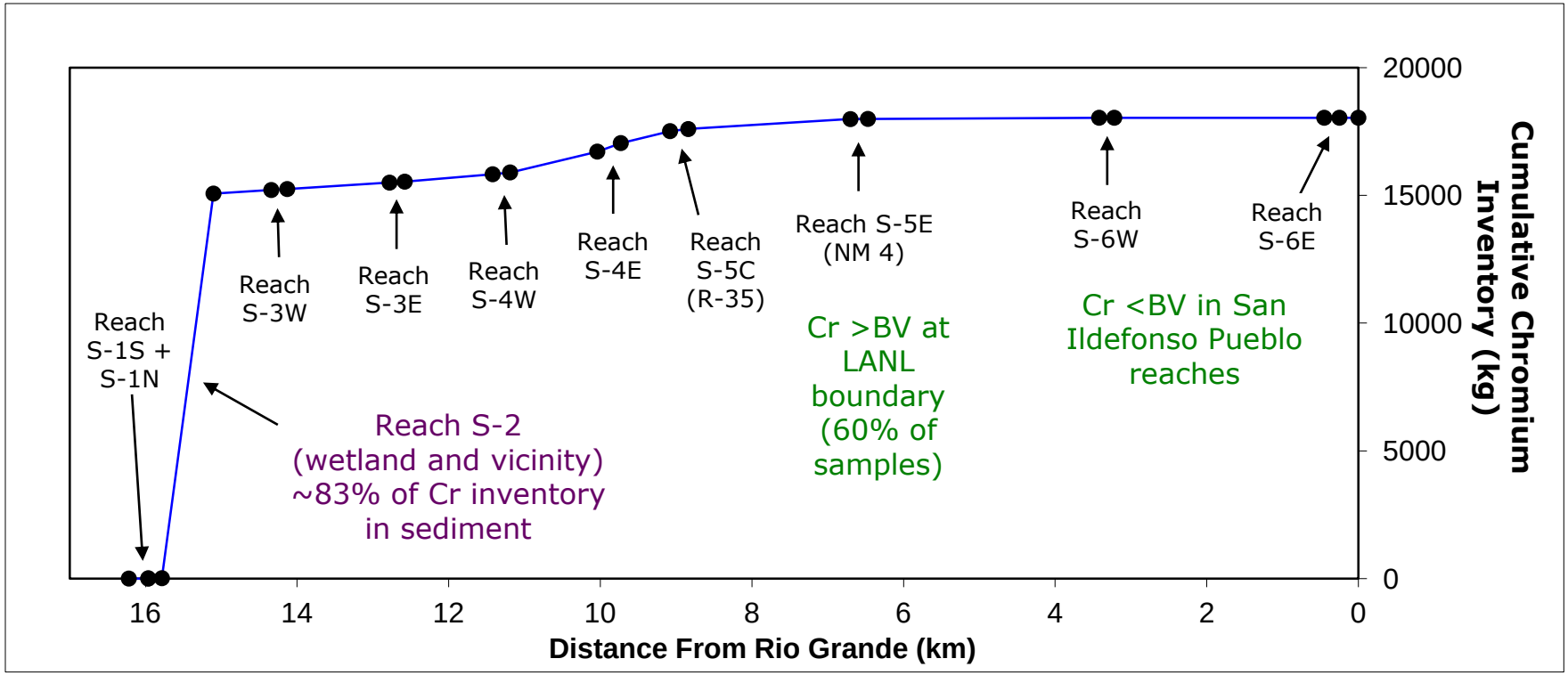


Chromium Concentration in Sediments

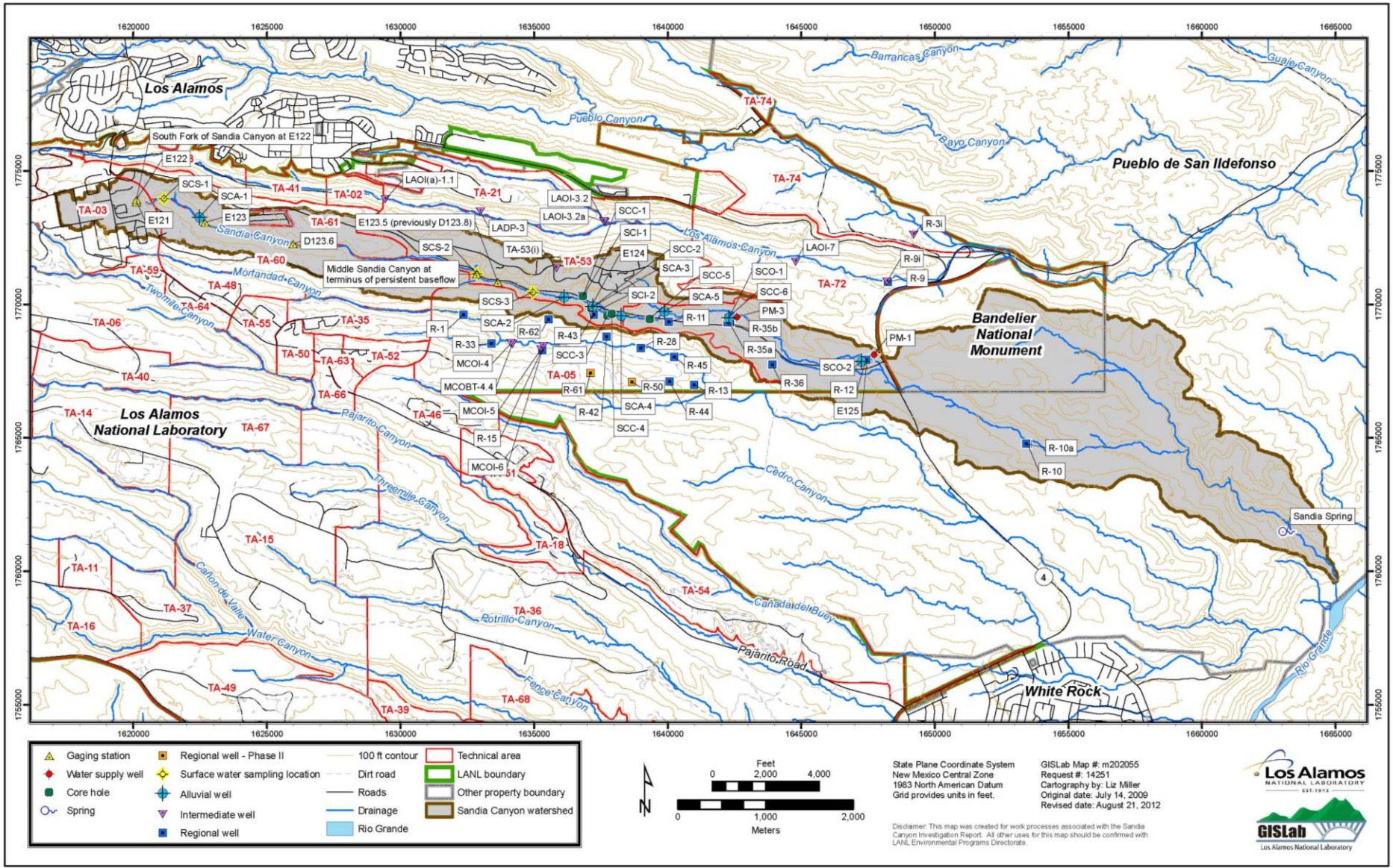


Chromium Inventory in Sediments

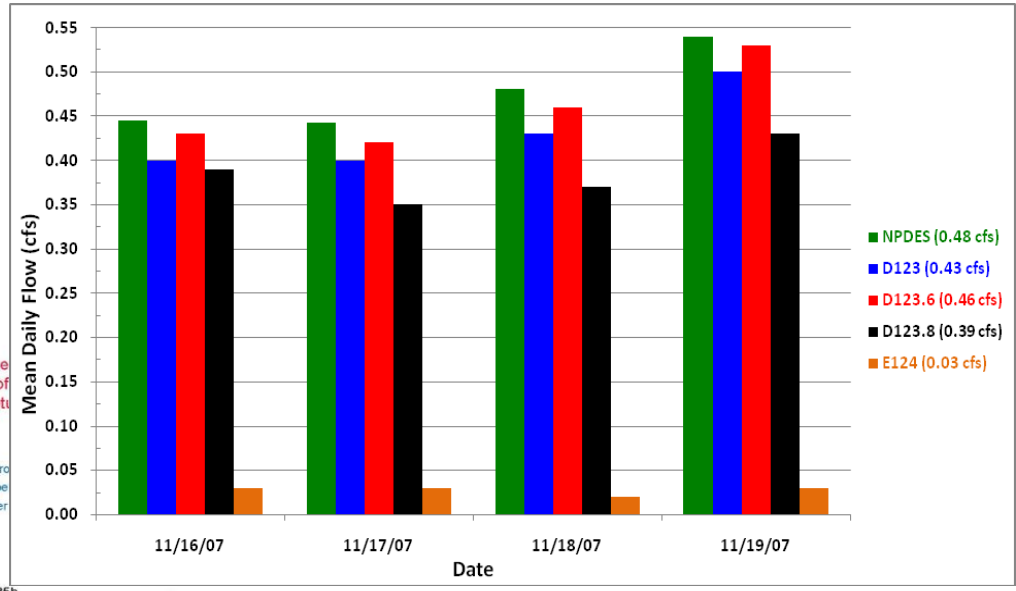
Total of ~18,000 kg Cr in sediment in Canyon, **>99% Cr(III)**, <1% Cr(VI)
Wetland reach has most of the Cr in sediment (~15,000 kg)



Groundwater Investigation



Water Balance Study



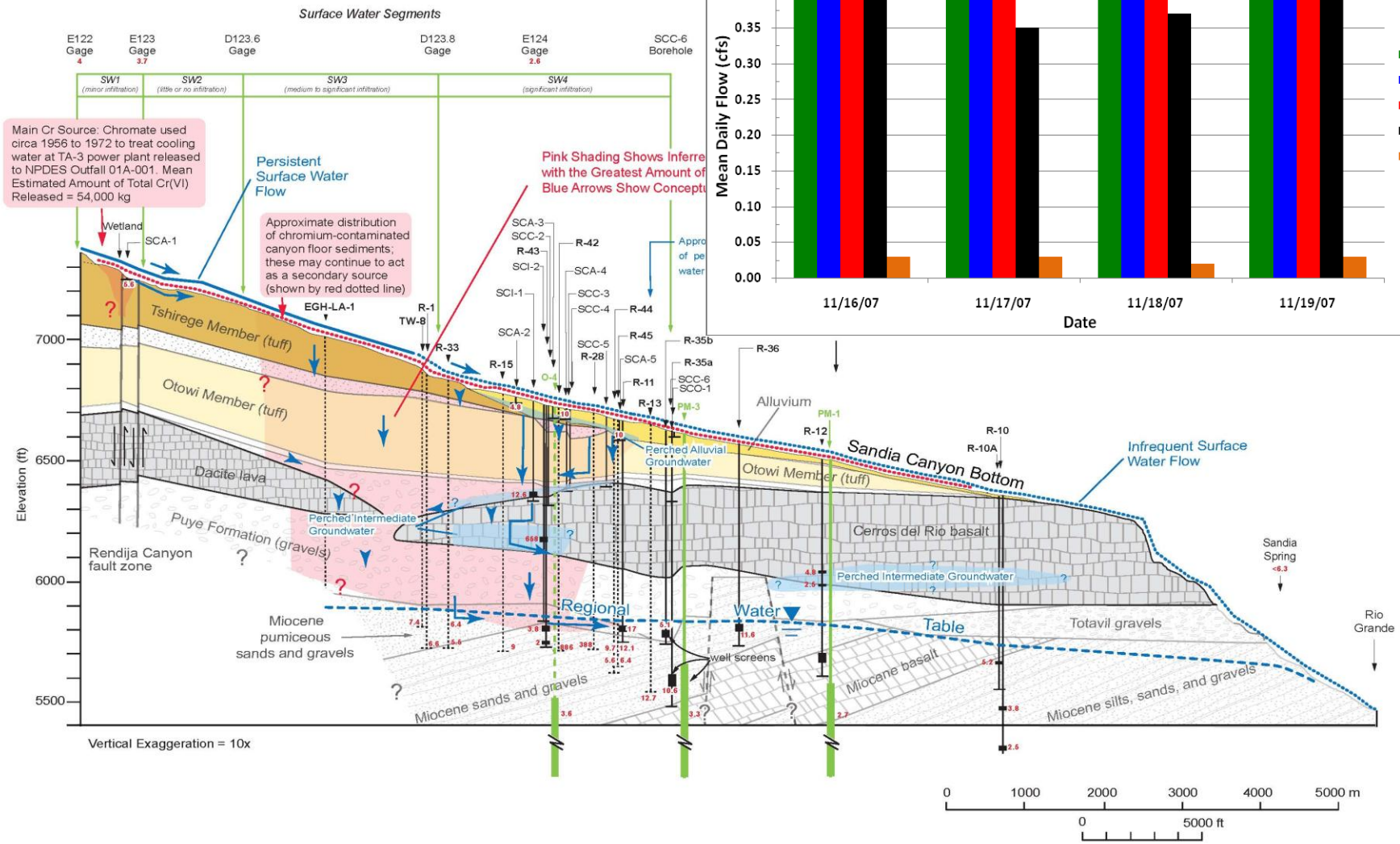
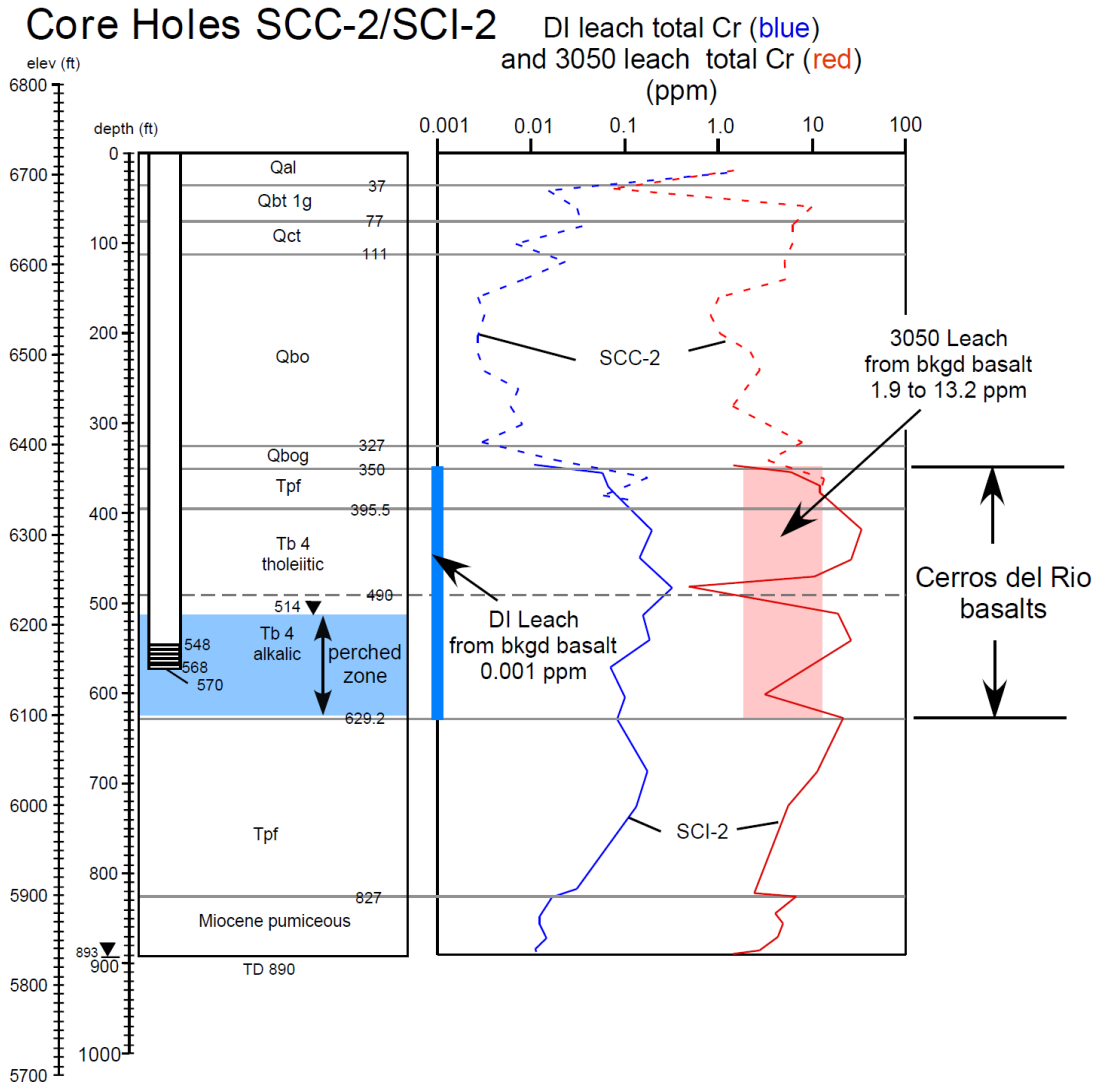


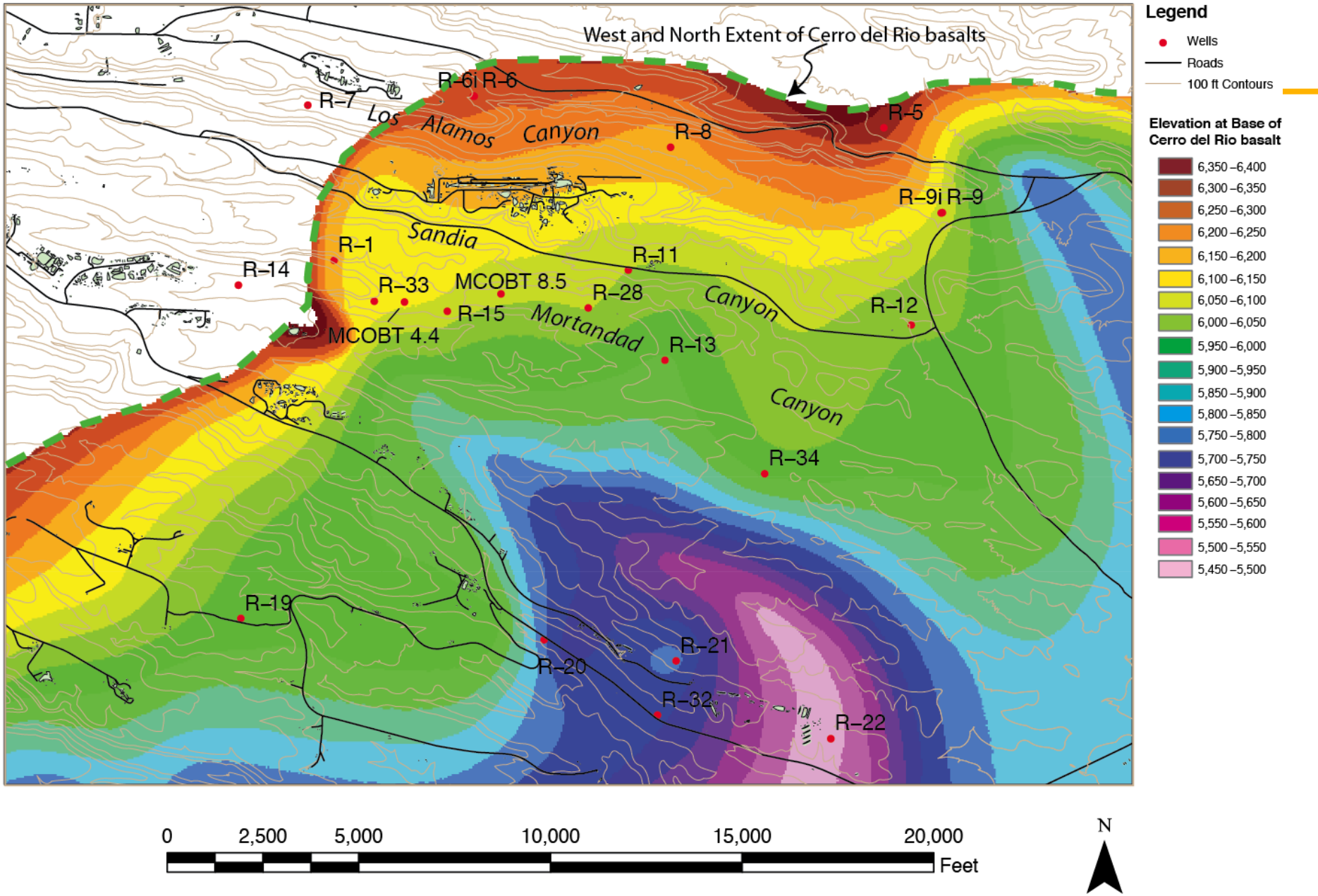
Figure 7.2-1. Conceptual hydrogeologic cross section showing potential chromium transport pathways and dissolved hexavalent chromium for surface water, monitoring wells, and water supply wells in the vicinity of Sandia Canyon. Red numbers indicate most recent (mostly 2009) values of chromium in units of µg/L. Wells indicated by solid lines are in Sandia Canyon; dashed wells are projected into Sandia Canyon from adjacent canyons.

Vadose-Zone

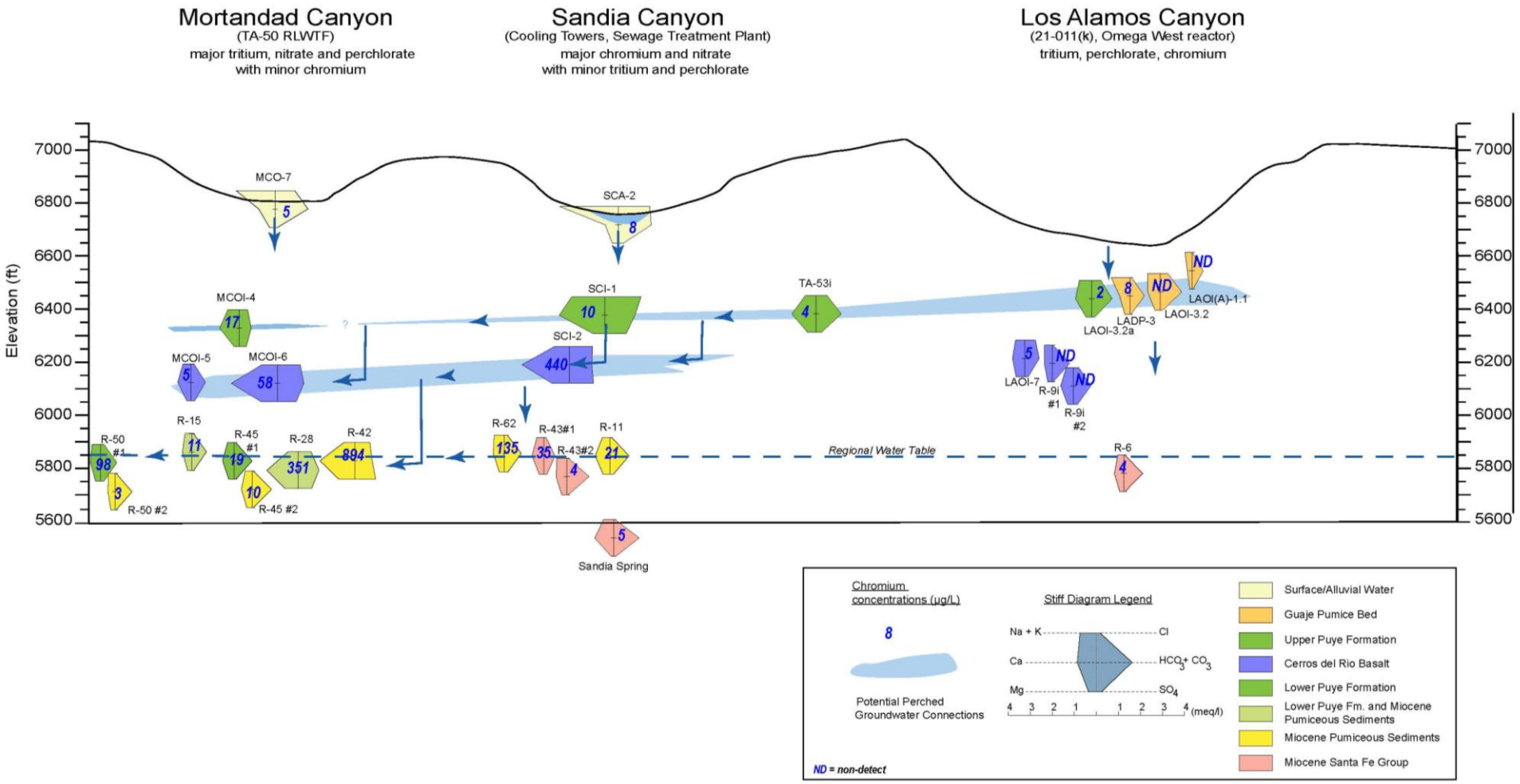


Los Alamos NATIONAL LABORATORY EST. 1943
Operated by Los Alamos Nation...

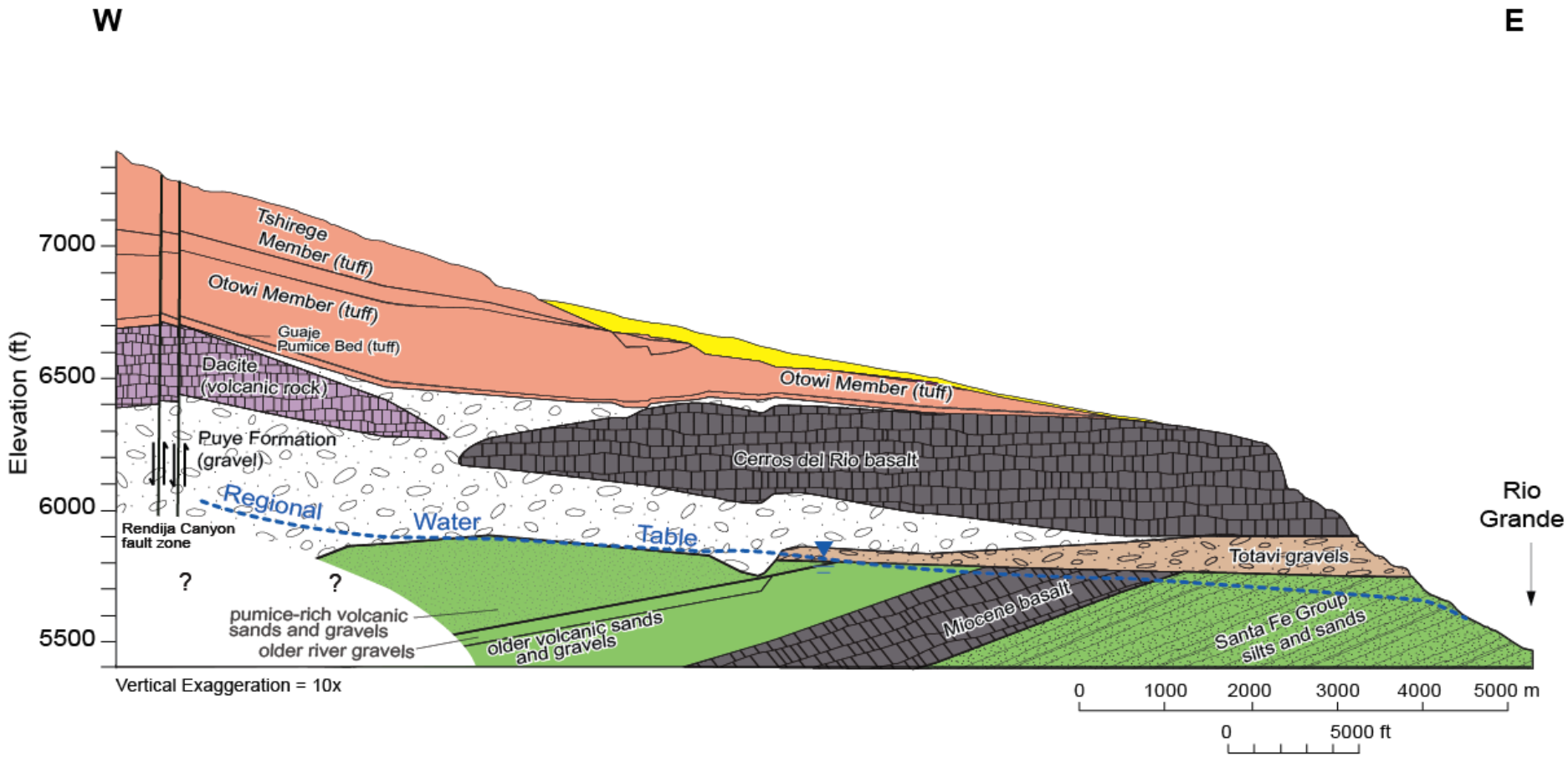
Base of Cerros del Rio Basalt



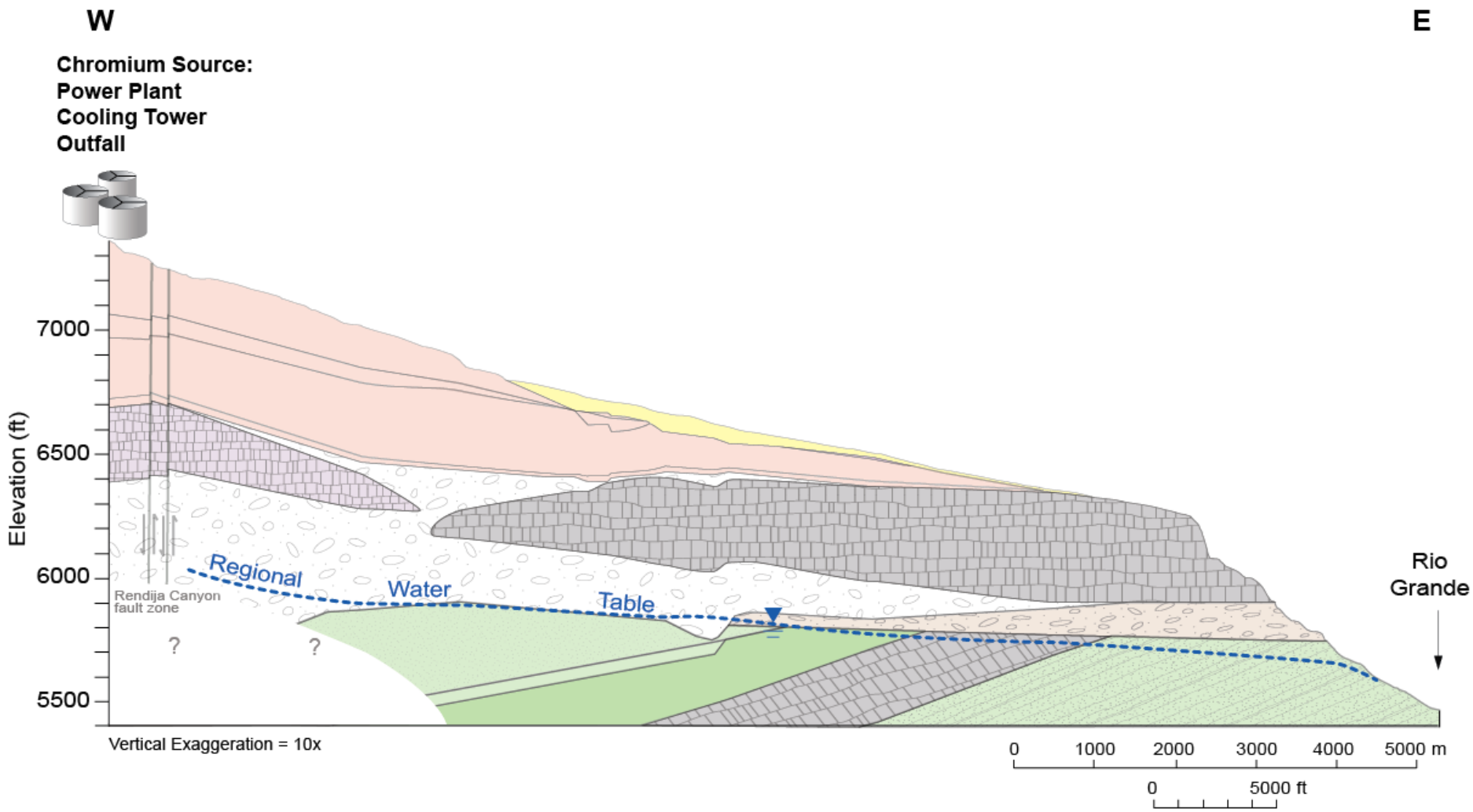
Groundwater Mixing



Geologic cross-section along Sandia Canyon



Conceptual model of chromium transport in the subsurface



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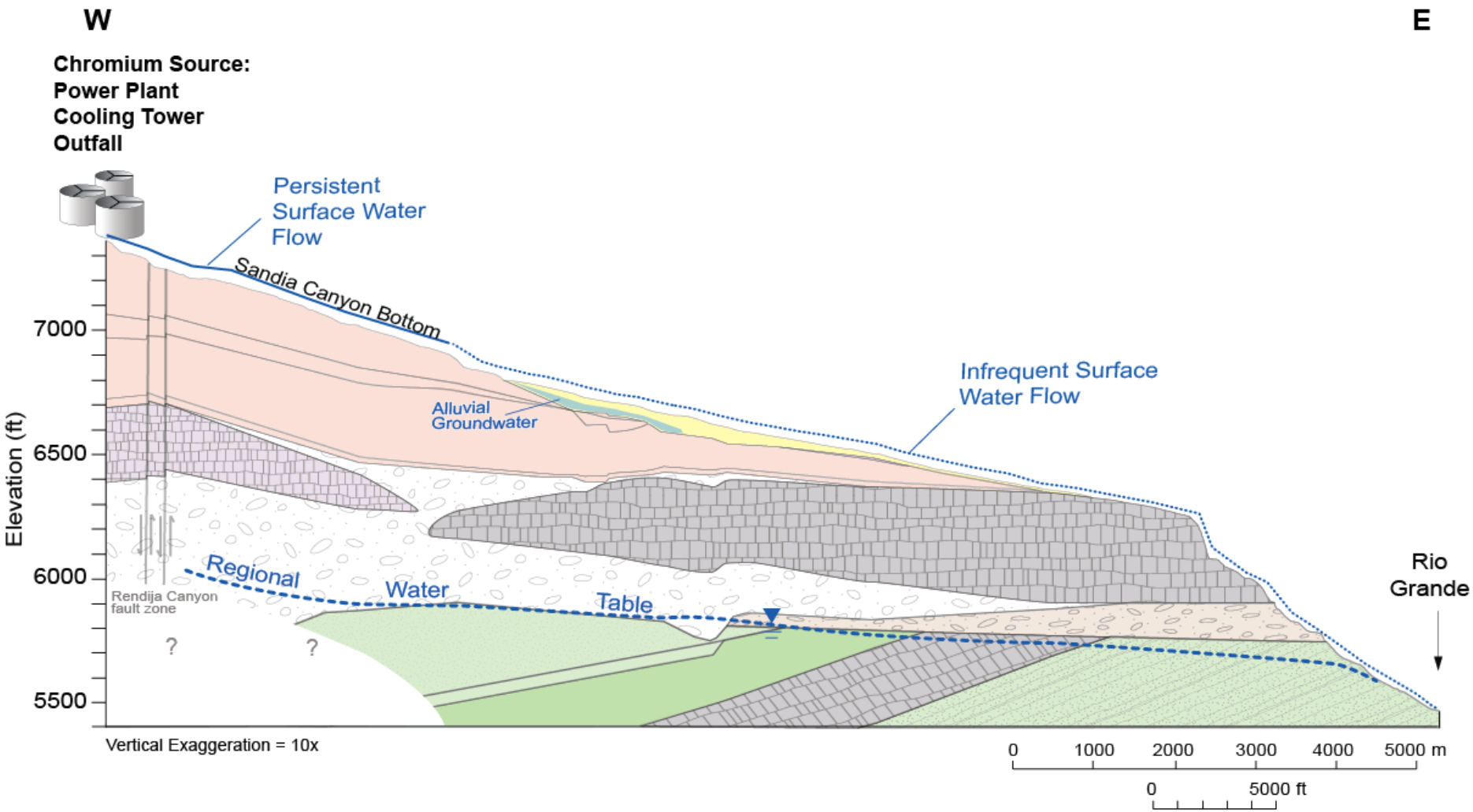

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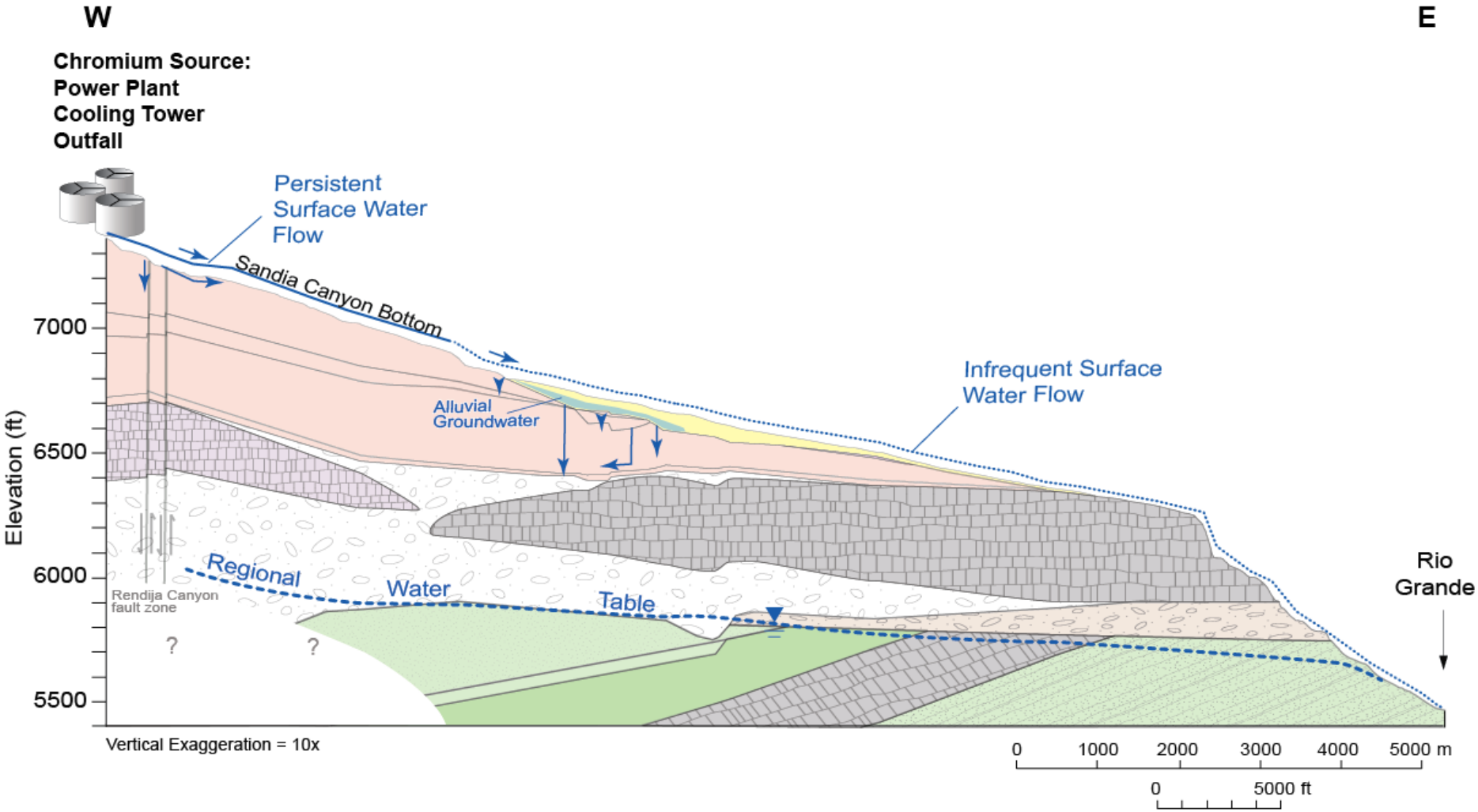

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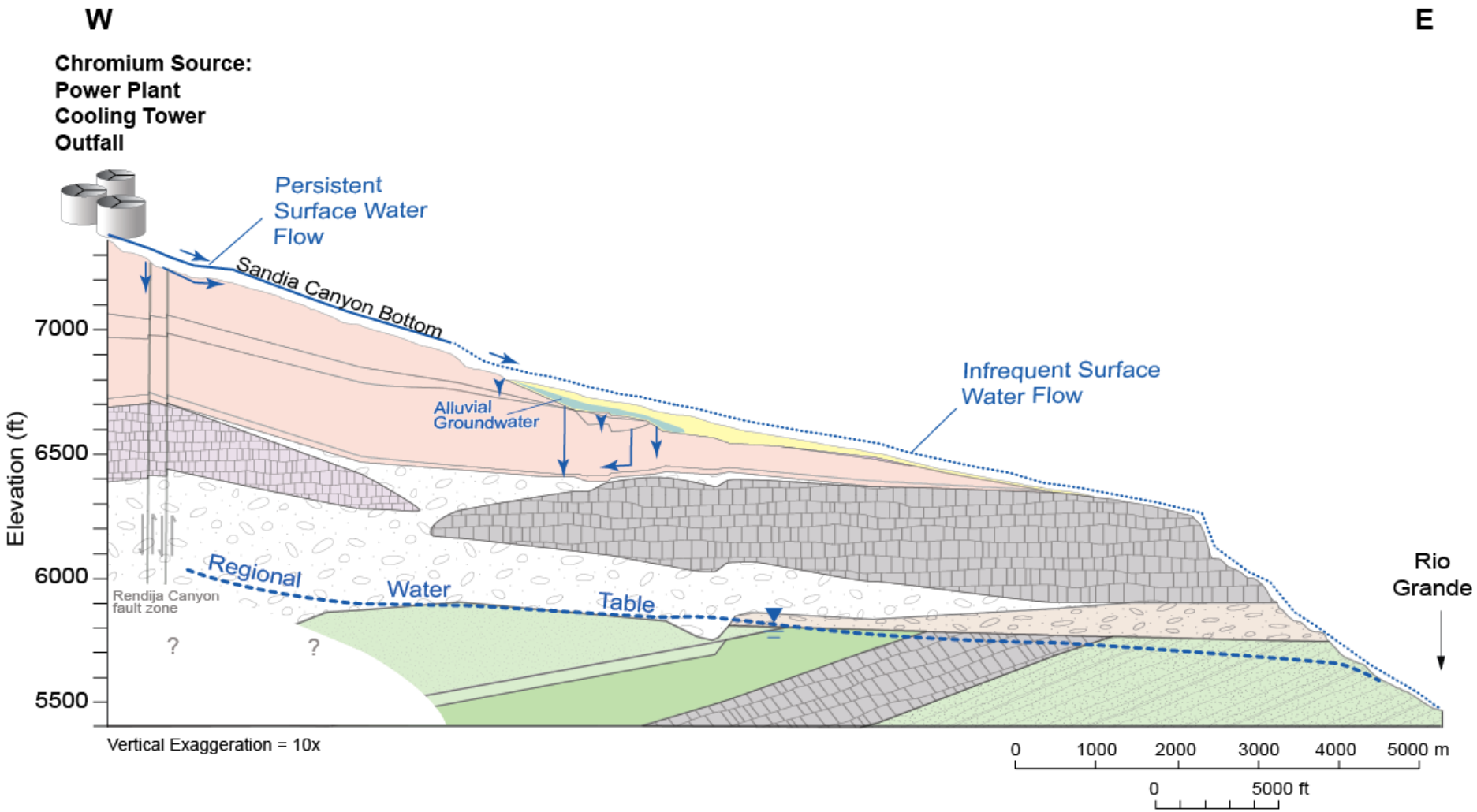

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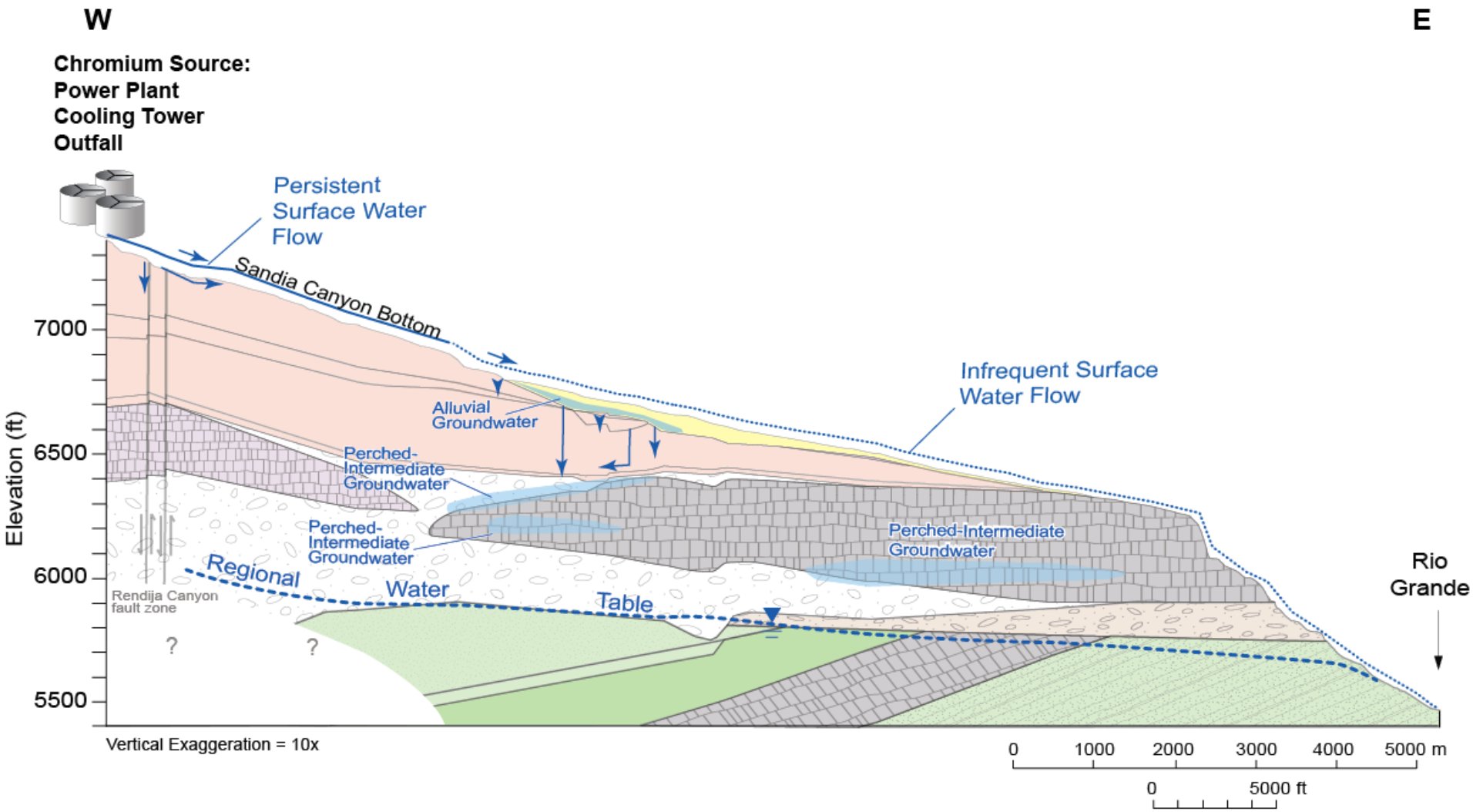

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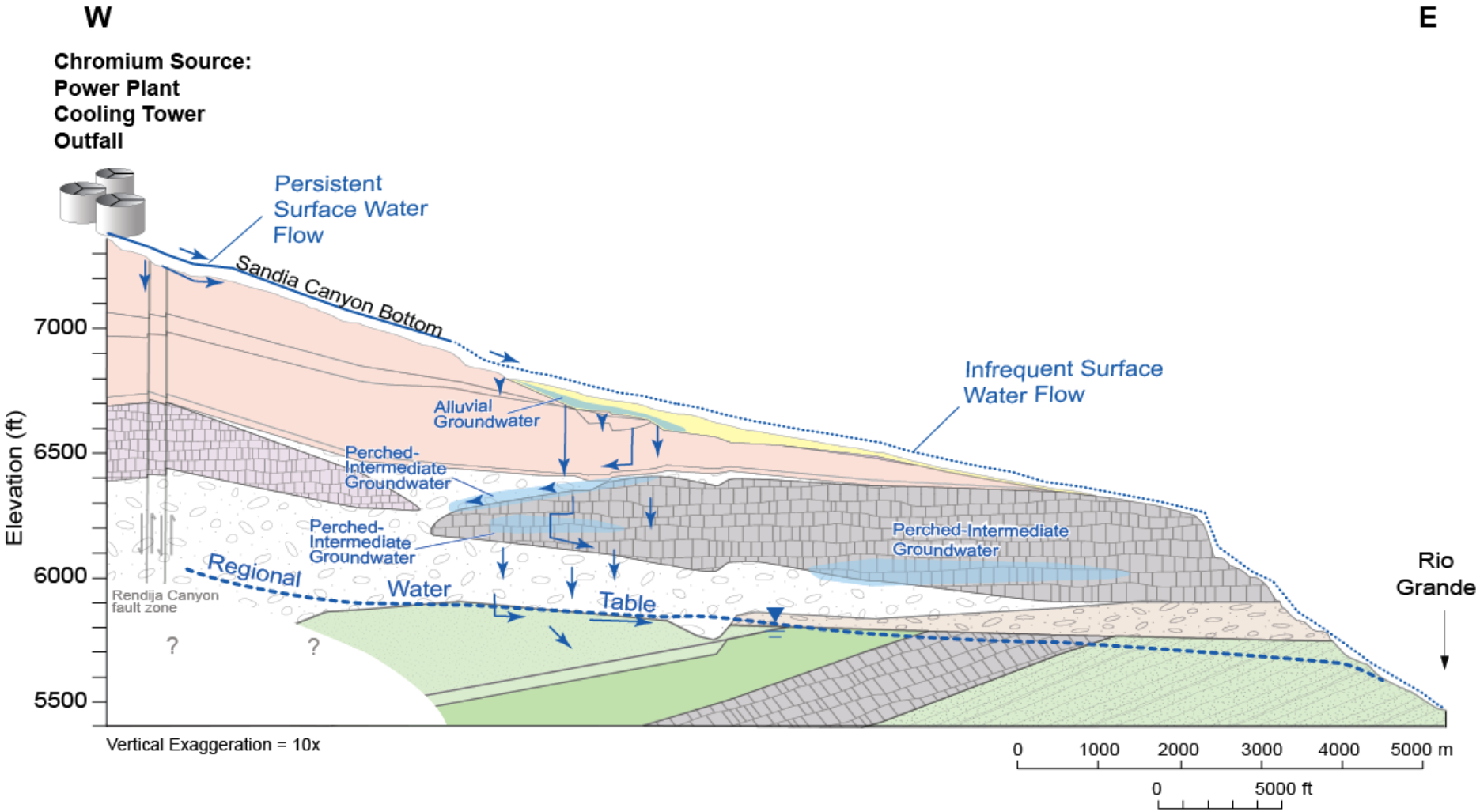

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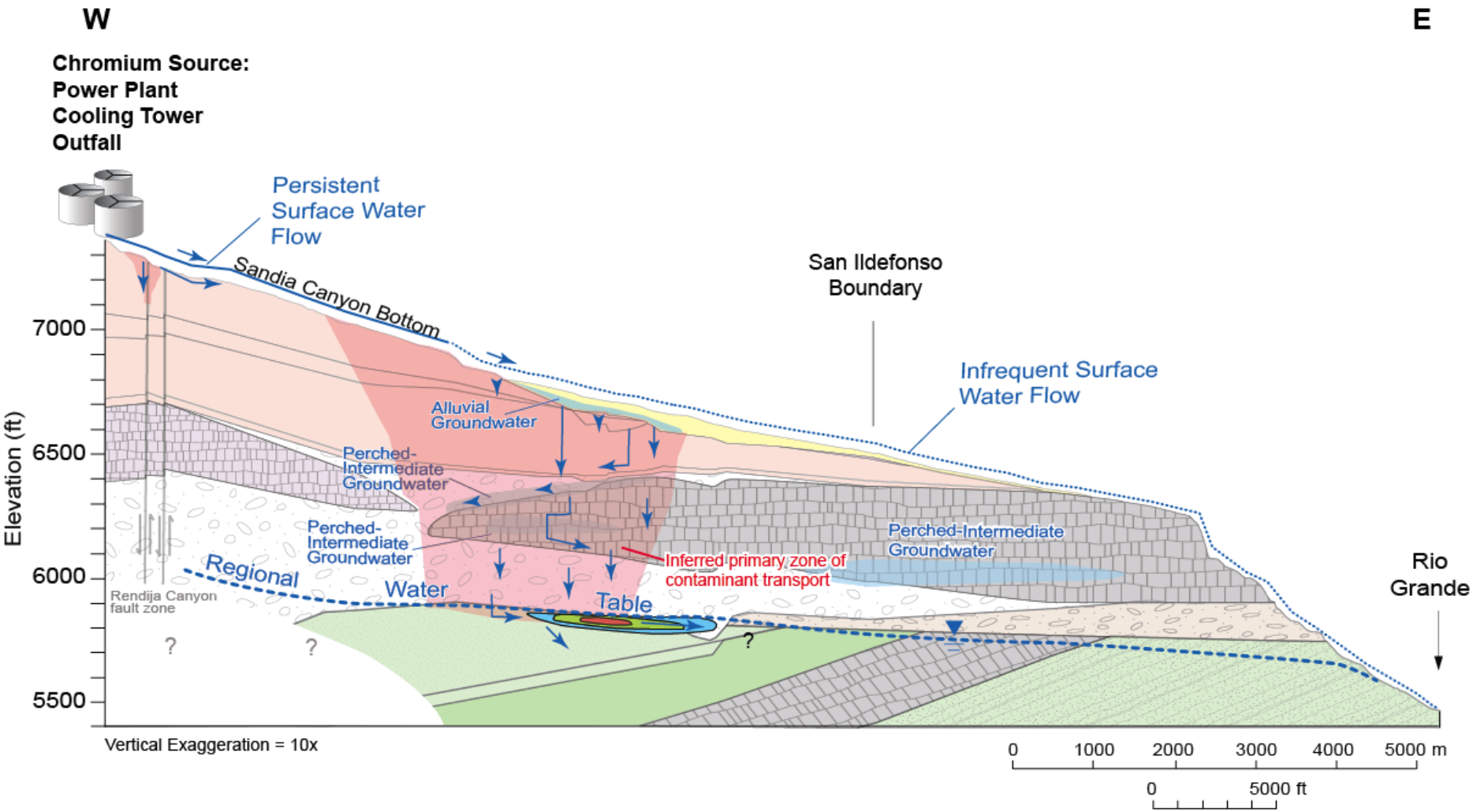
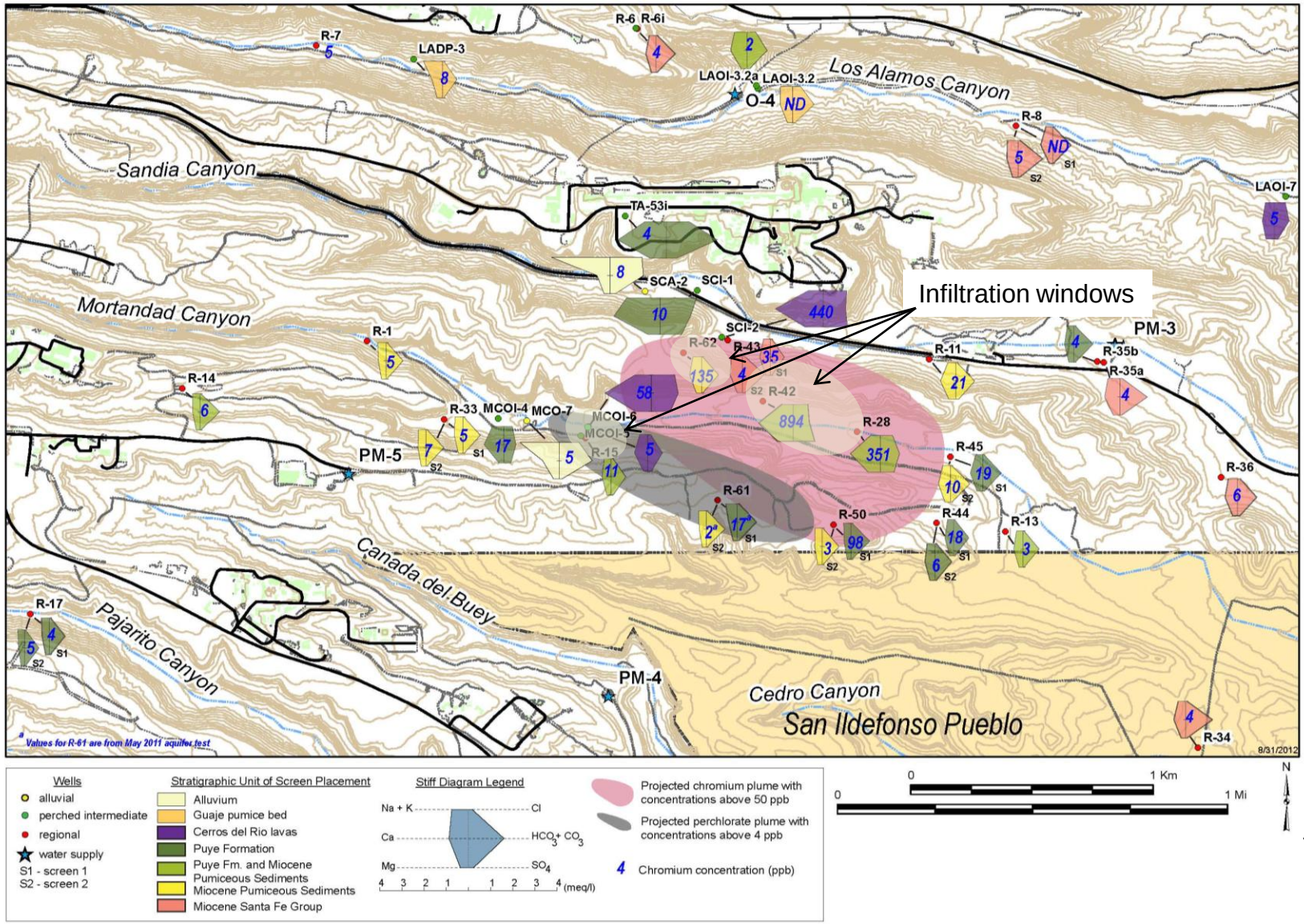


Groundwater Mixing/Resultant Plumes



Path Forward

- **Phase 2 Investigation Report to NMED - September 30, 2012**
- **NMED Review**
- **Wetland Stabilization – planned for FY13**
- **Corrective Measures Evaluation – TBD**
- **Possible Interim Measure as bridge to CME if necessary**
  - Under evaluation