

“Roadblocks to Compliance”

A study in assessment of the ground water contamination of a Barium facility



Caltrans Project Delivery Process

There is no mechanism within the environmental document delivery process to cleanup sites outside of project delivery.

- Modesto Stockpiles
- Maintenance Station UST's



Caltrans / DTSC Interagency Agreement



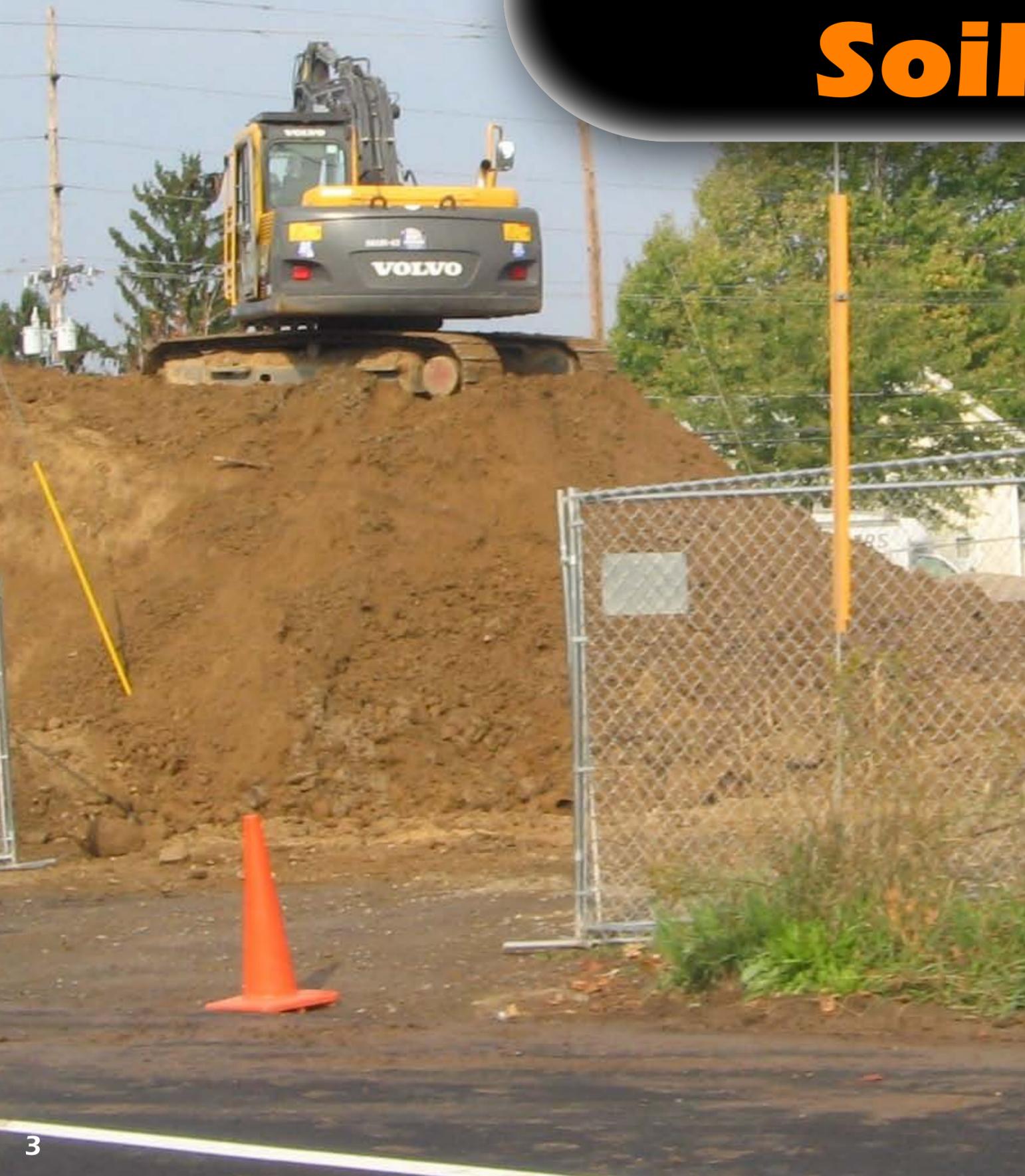
Modesto Stockpiles

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Barium-contaminated Soil, Modesto



- Three stockpiles totaling 120,000 yd³

Site History



1950's – Early 1960's

- 1961 – Division of Highways purchases 4.3 acres from FMC Corp., Modesto Barium Plant
- Hwy. 99 constructed through FMC impoundment
- Excess soil placed on State-owned Right of Way
- FMC begins discharge (1957 –1980)



Characterization

BBA

Stockpile Soil

- 51 Borings; 278 Samples
- Ba
 - 196,000 mg/kg
 - 2,300 µg/l
 - 220 µg/l –DI

Groundwater

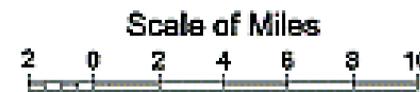
- 35' bgs; SE Flow; 0.001'/ft.
- 13 Metals, PAH's, NO₃, SO₄, S₂, Anions/Cations
- < PMCL for all Constituents
- Elevated Concentrations of Ba, Cr, NO₃, SO₄, TDS



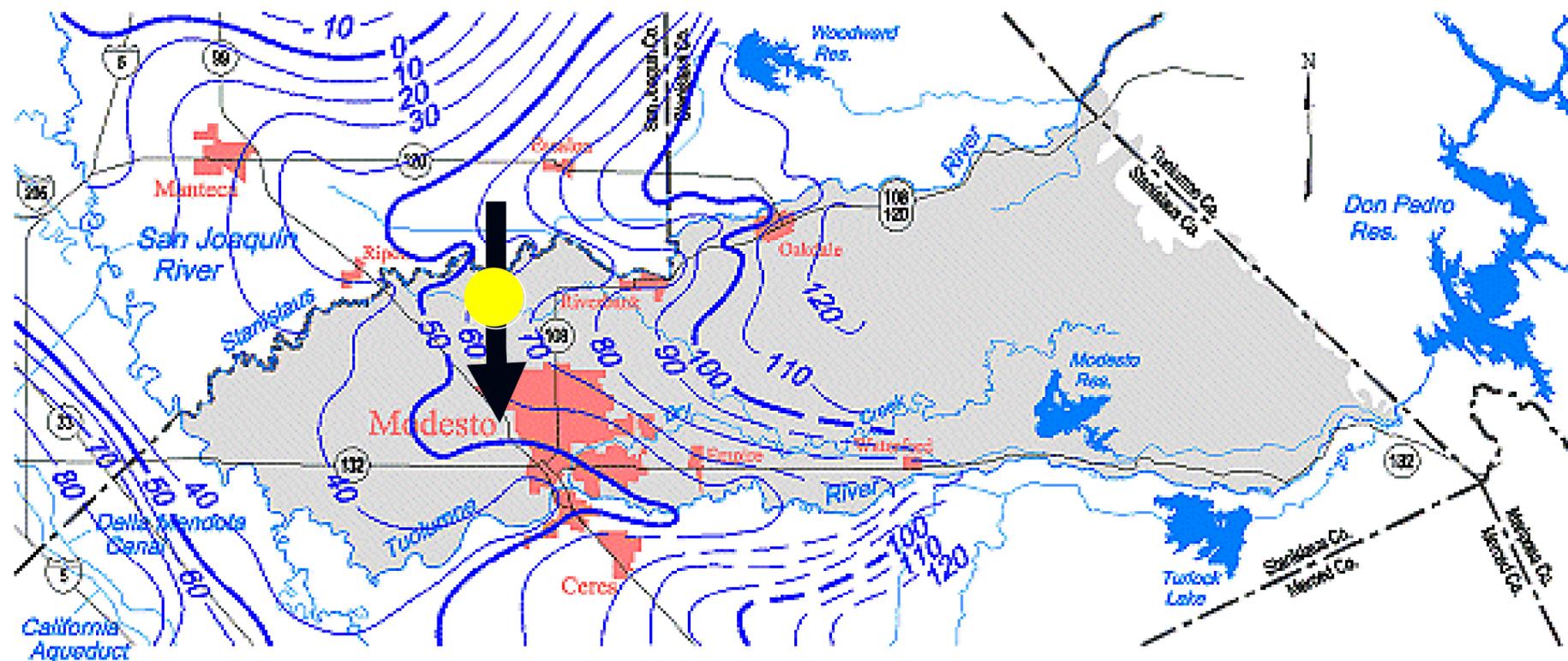
First Encountered Groundwater (1969)

Modesto Groundwater Basin

Spring 1969, Lines of Equal Elevation of Water in Wells, Unconfined Aquifer



Disclaimer: Base map created from current USGS 1:24,000 and 1:100,000 maps. Some base map features may not have been present (i.e. roads, canals, reservoirs) for the water year shown.



Contours are dashed where inferred. Contour interval is 10 feet.

FMC Site
with GW
Flow
Direction

Modesto Stockpiles



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Compliance Approaches

Gain the attention of Caltrans District Directors

- Use All Regulatory Means
- Adopt Orders / Time Schedules
Example: Storm Water Program

