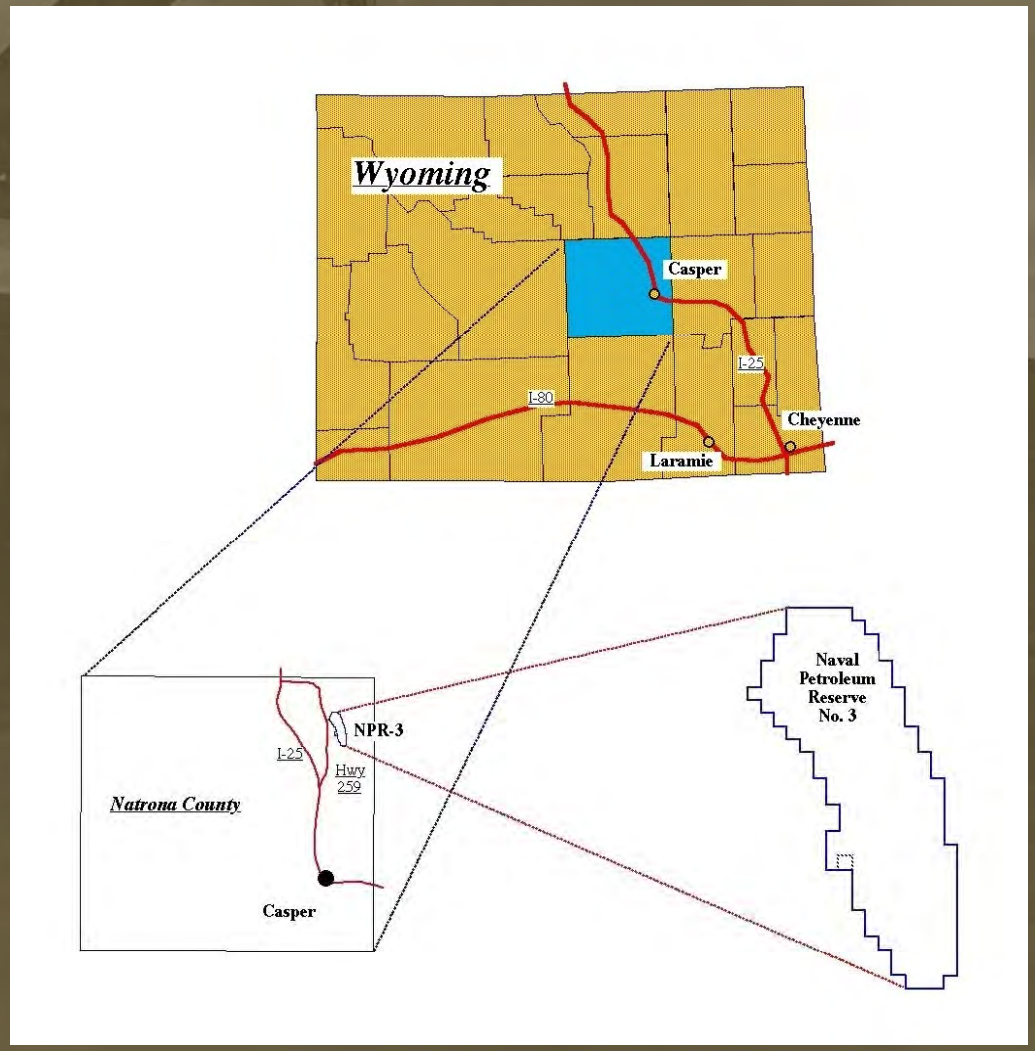
Rocky Mountain Oilfield Testing CENTER

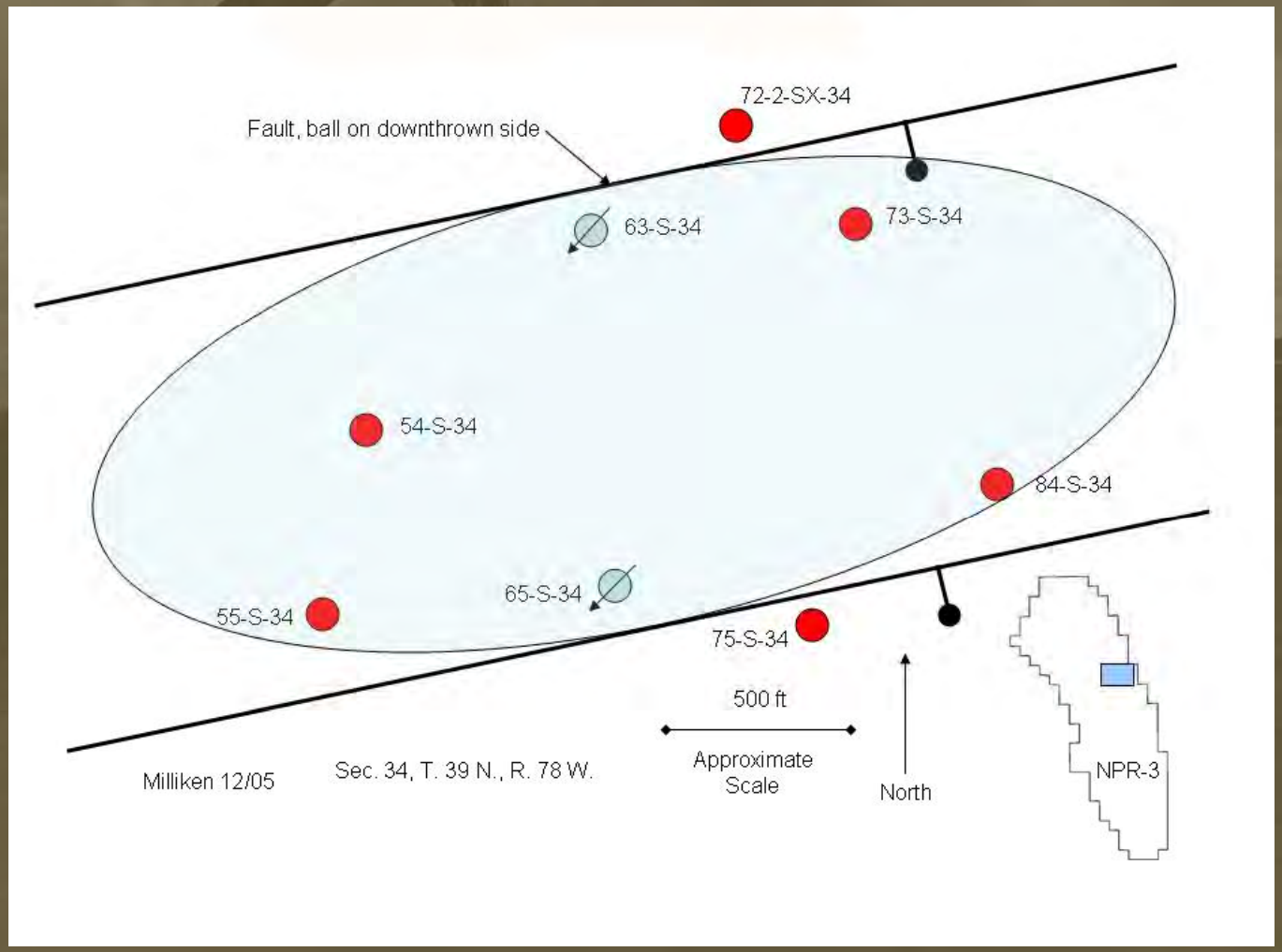
Surfactant Flooding of the Shannon Formation and Low-Temperature Geothermal Applications

Lyle A. Johnson, PE, RMOTC

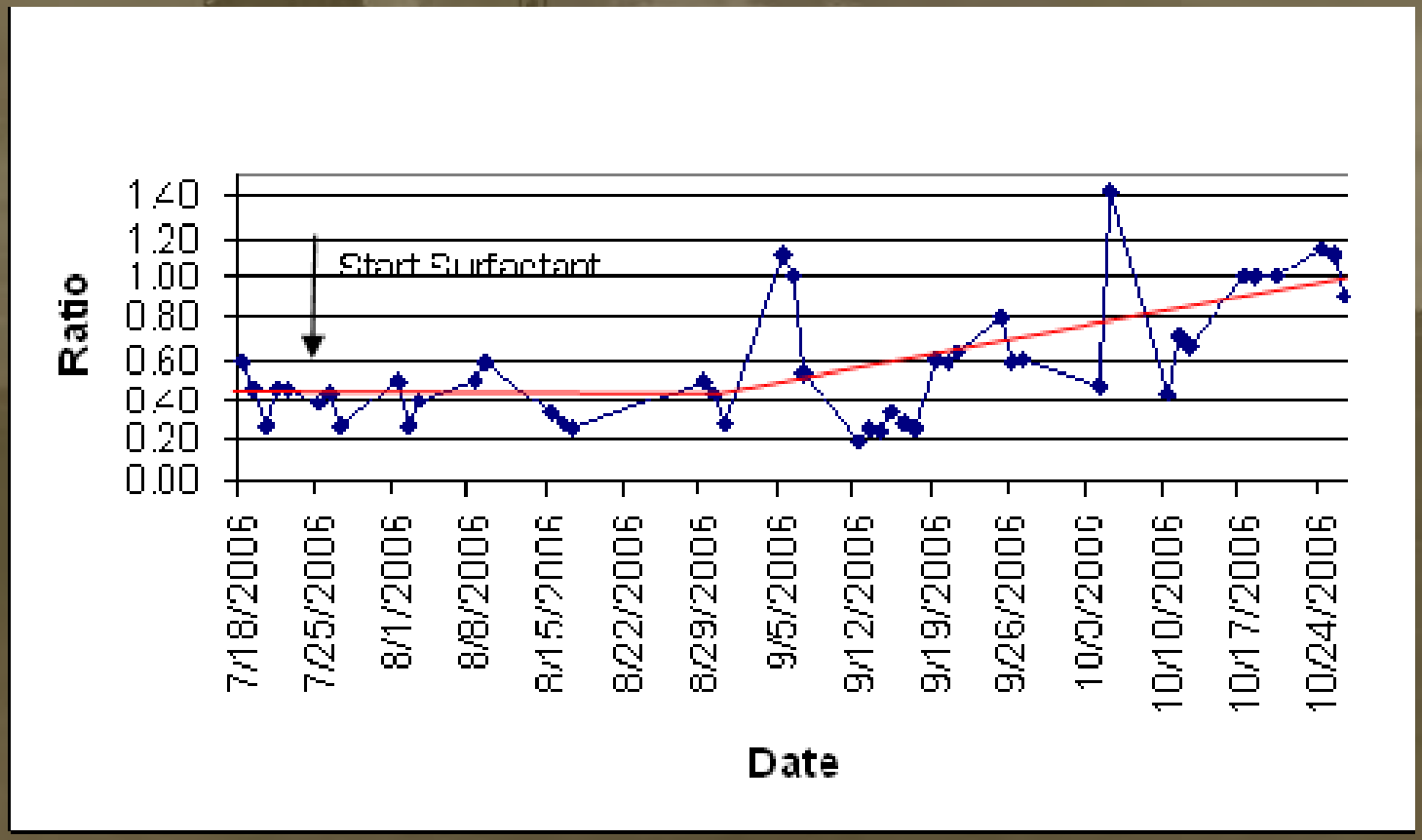
RMOTC Location

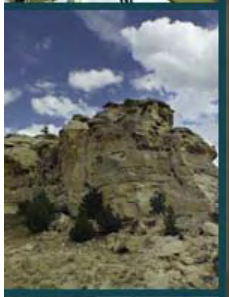


AEDC Surfactant Flood Project

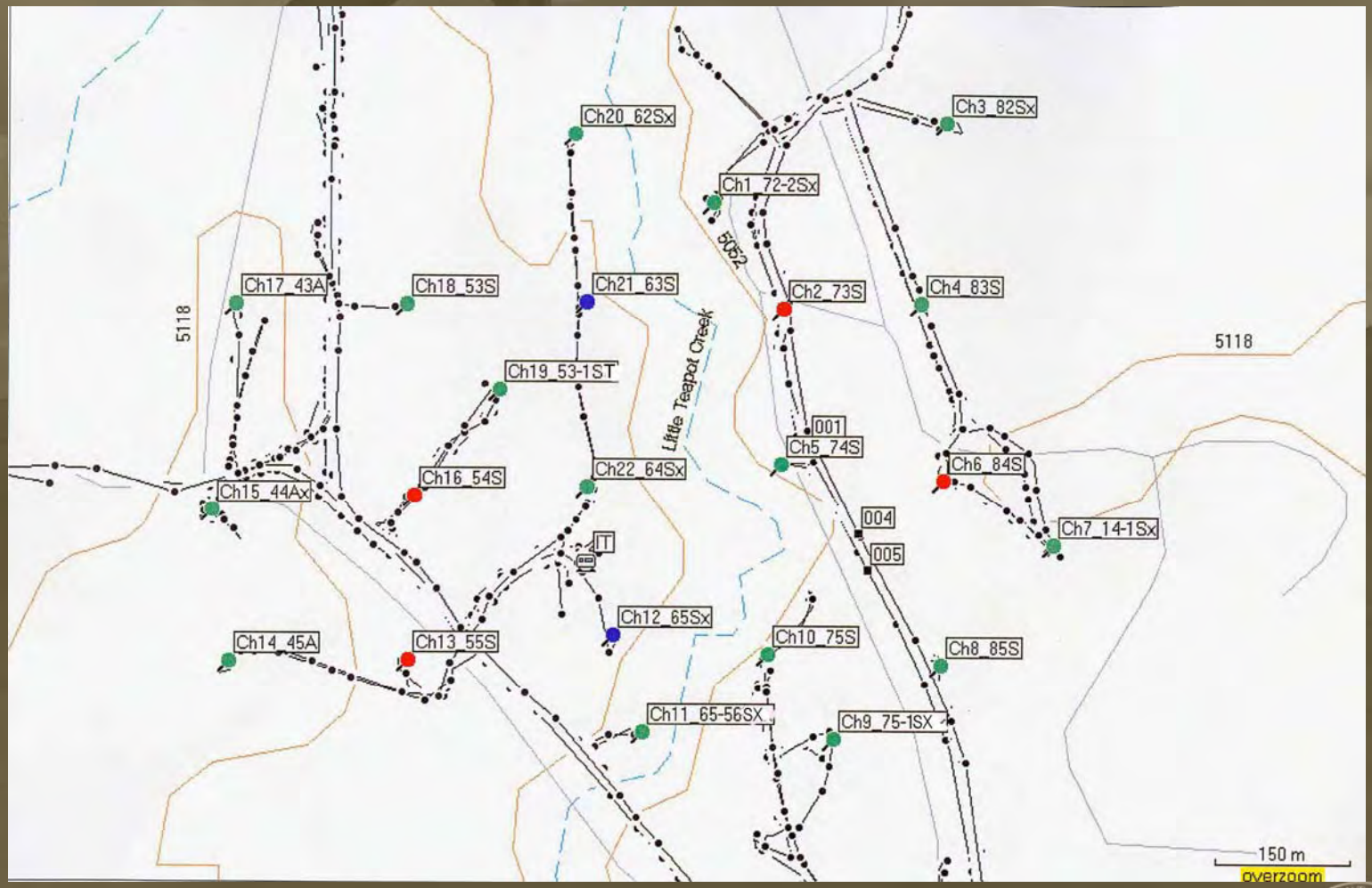


Oil/Water Ratio Well 84-S-34

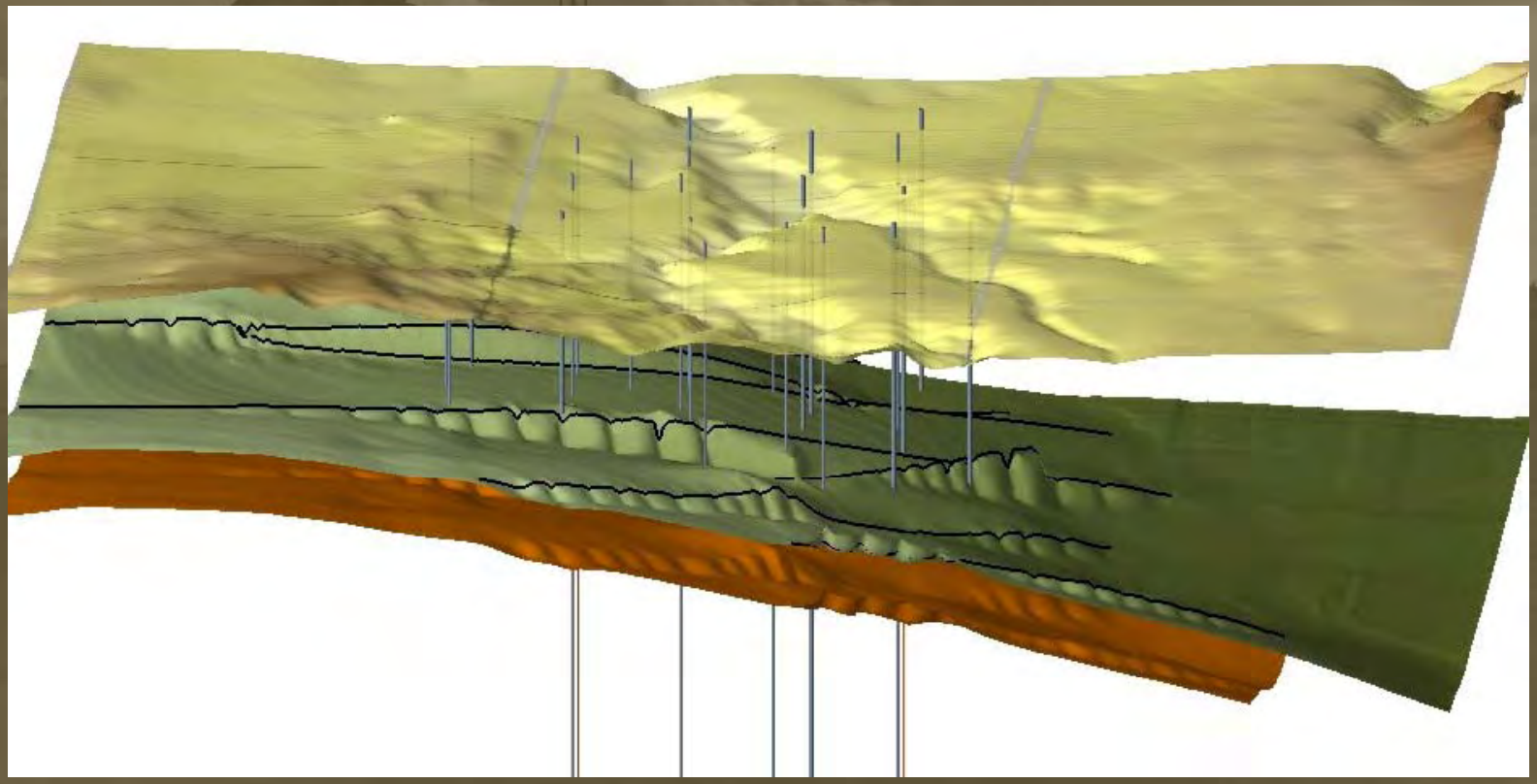




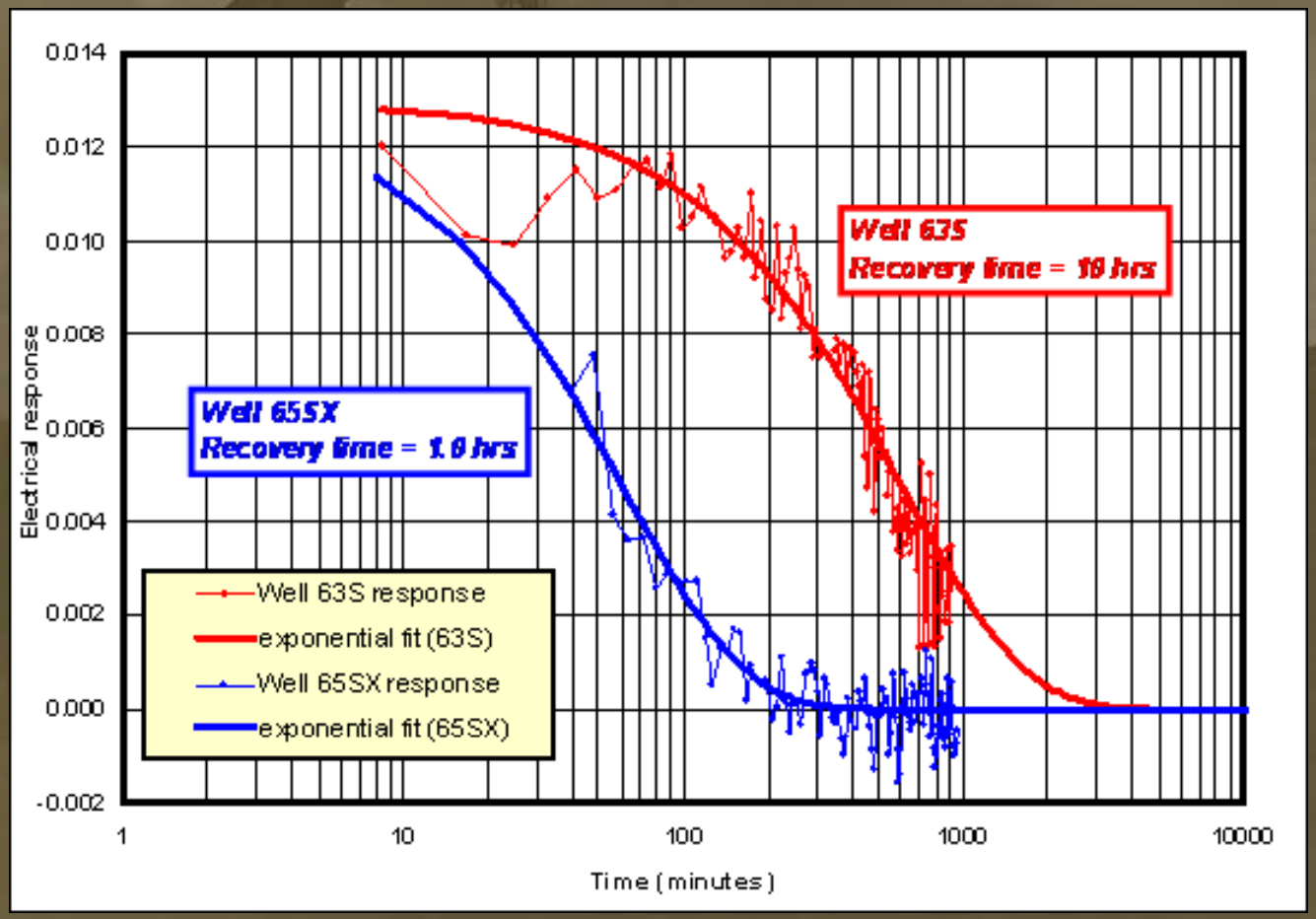
HRR Electrodes Layout

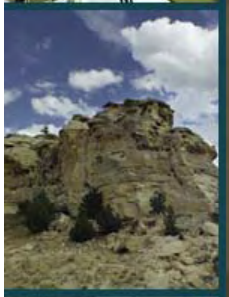


Oblique View of Site

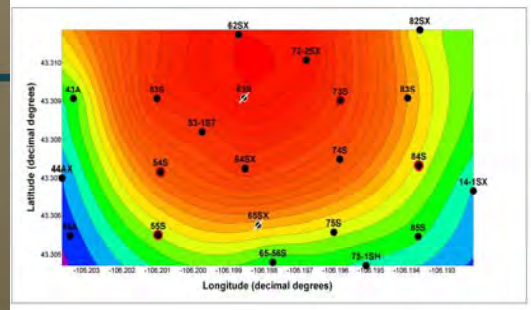


Slug Test Approximations

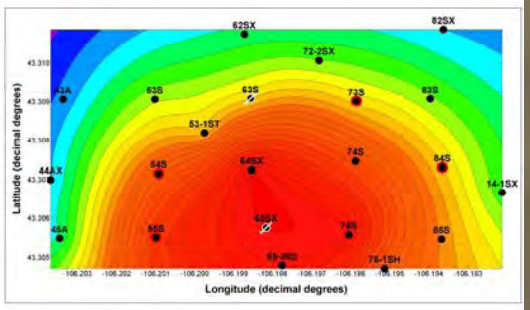




63S

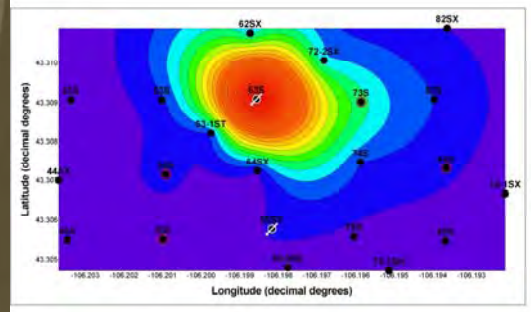


65SX

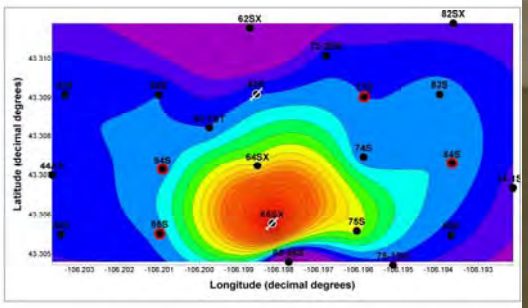


Background E-field before an injection

63S

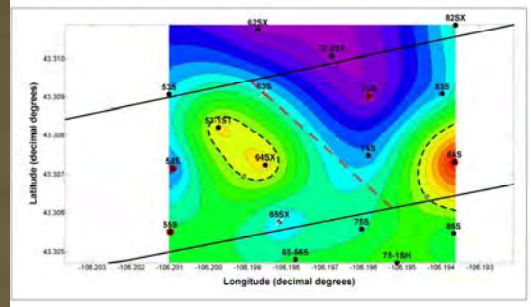


65SX

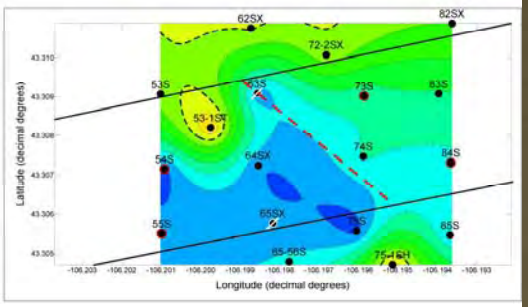


Additional E-field during an injection

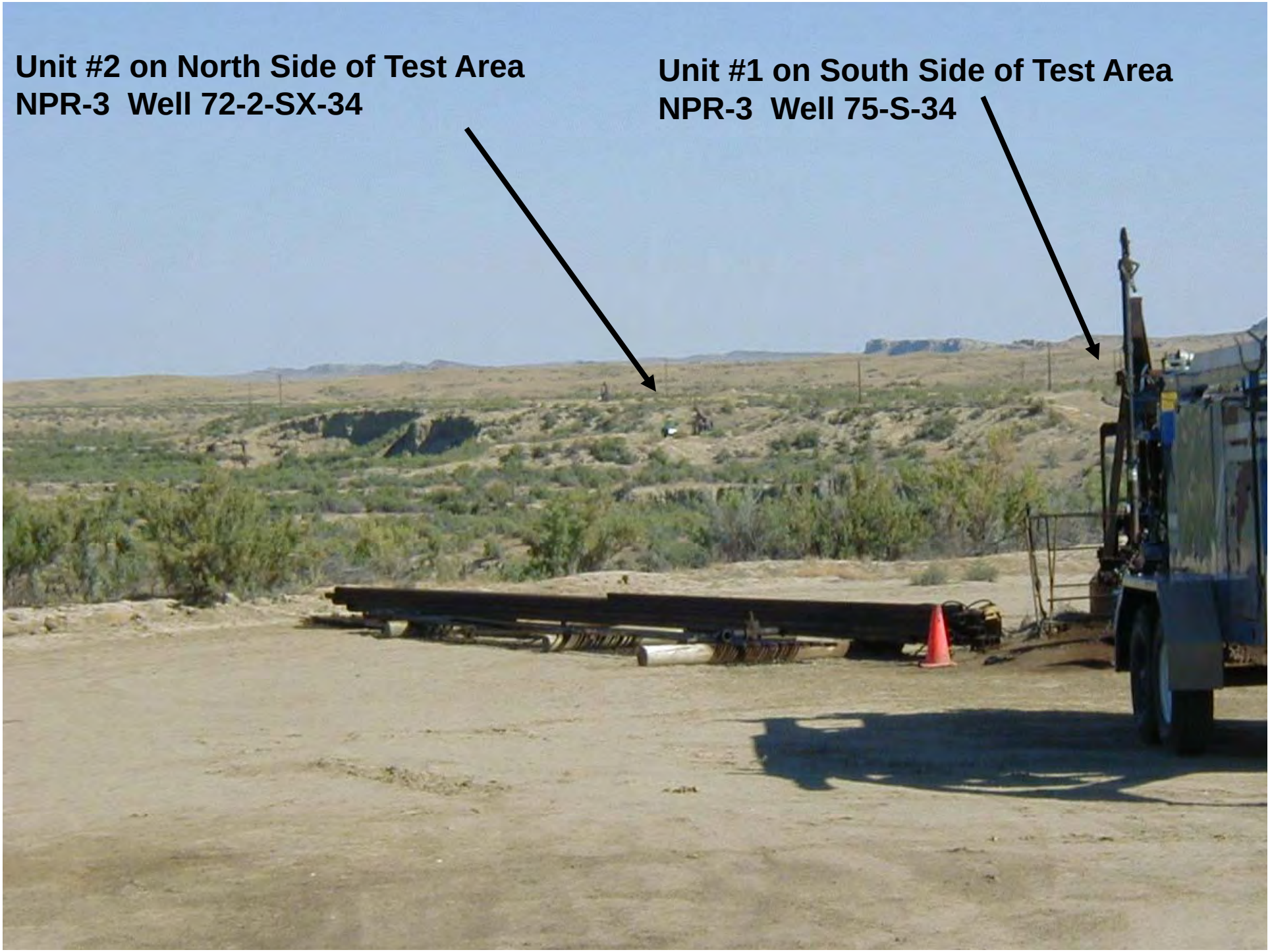
63S



65SX



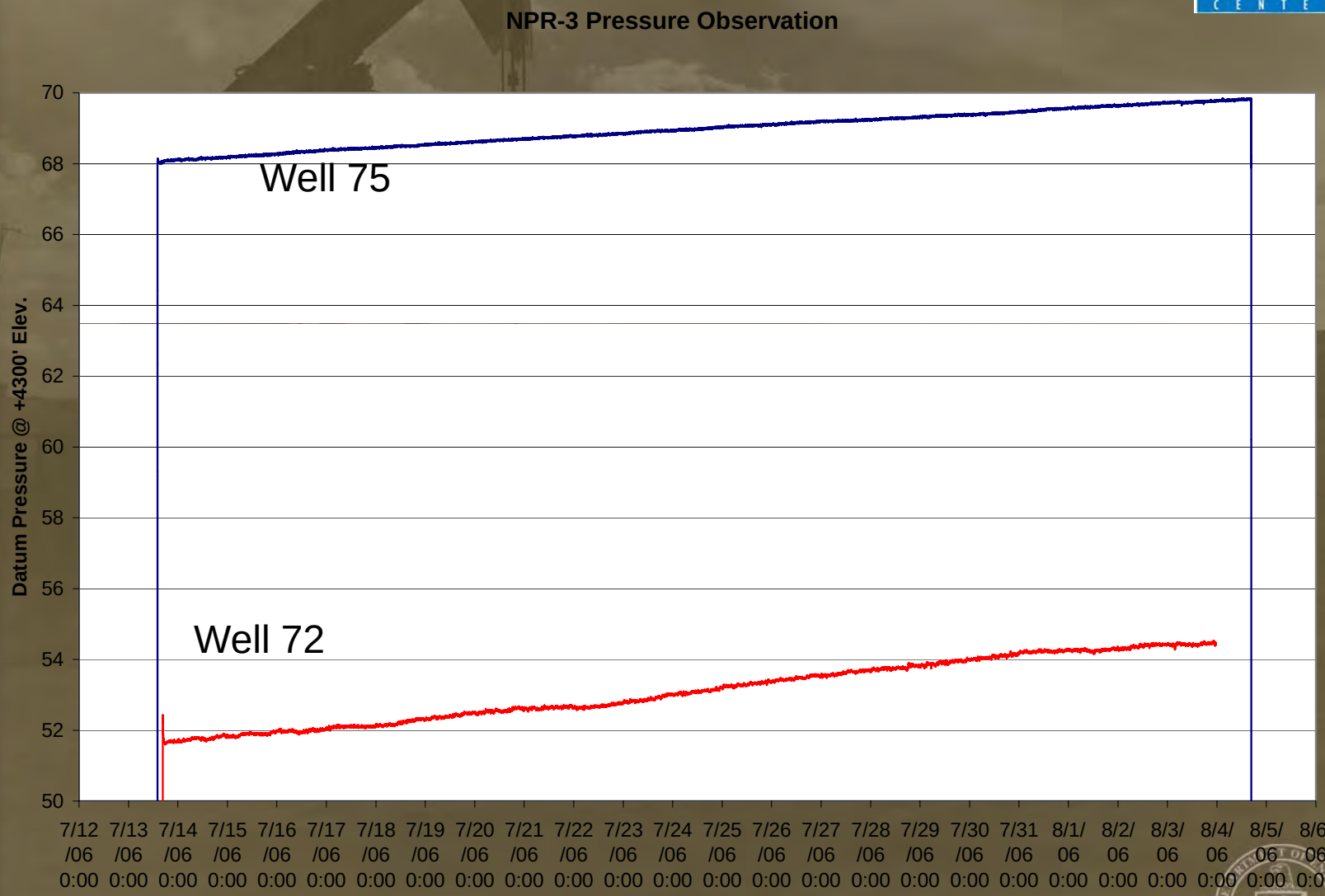
Residual E-field after all injections


Unit #2 on North Side of Test Area
NPR-3 Well 72-2-SX-34
Unit #1 on South Side of Test Area
NPR-3 Well 75-S-34

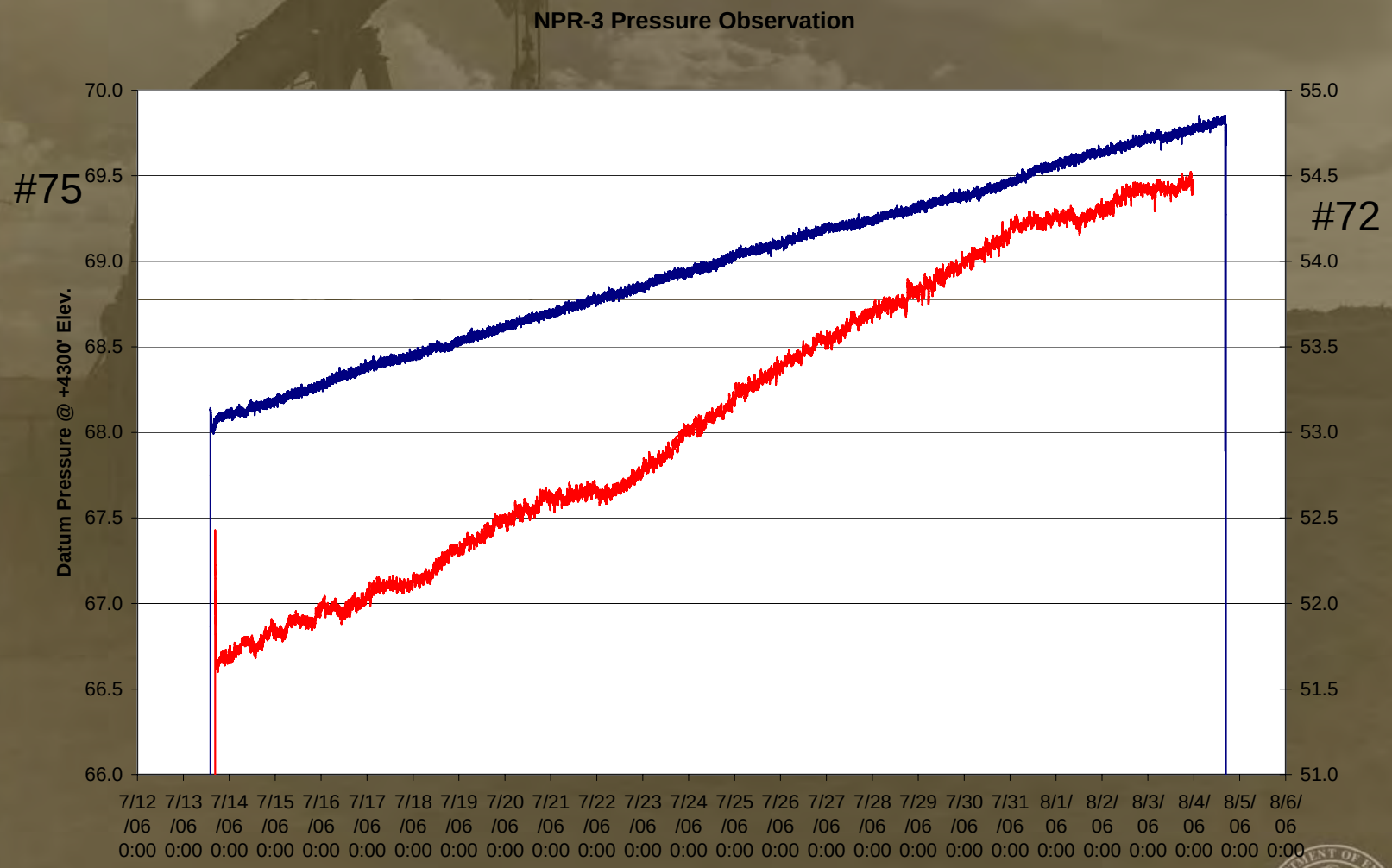
CHURCHILL

SONY

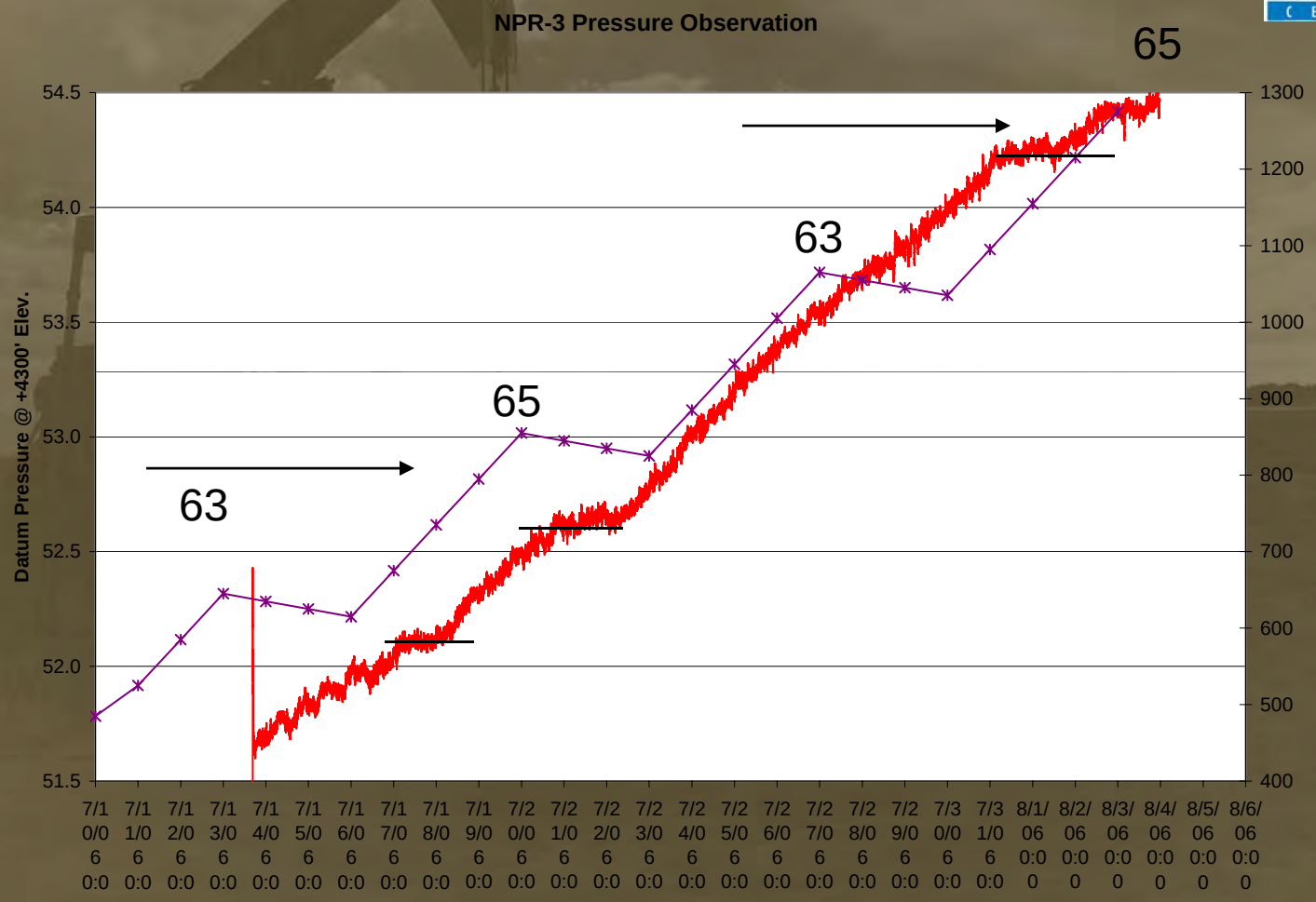
Observed Pressure Adjusted to Datum



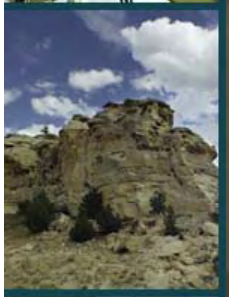
High and steadily increasing pressure appears unimpacted by injection



Cumulative Net Injection and Down Gradient Pressure (72-2-SX-34)

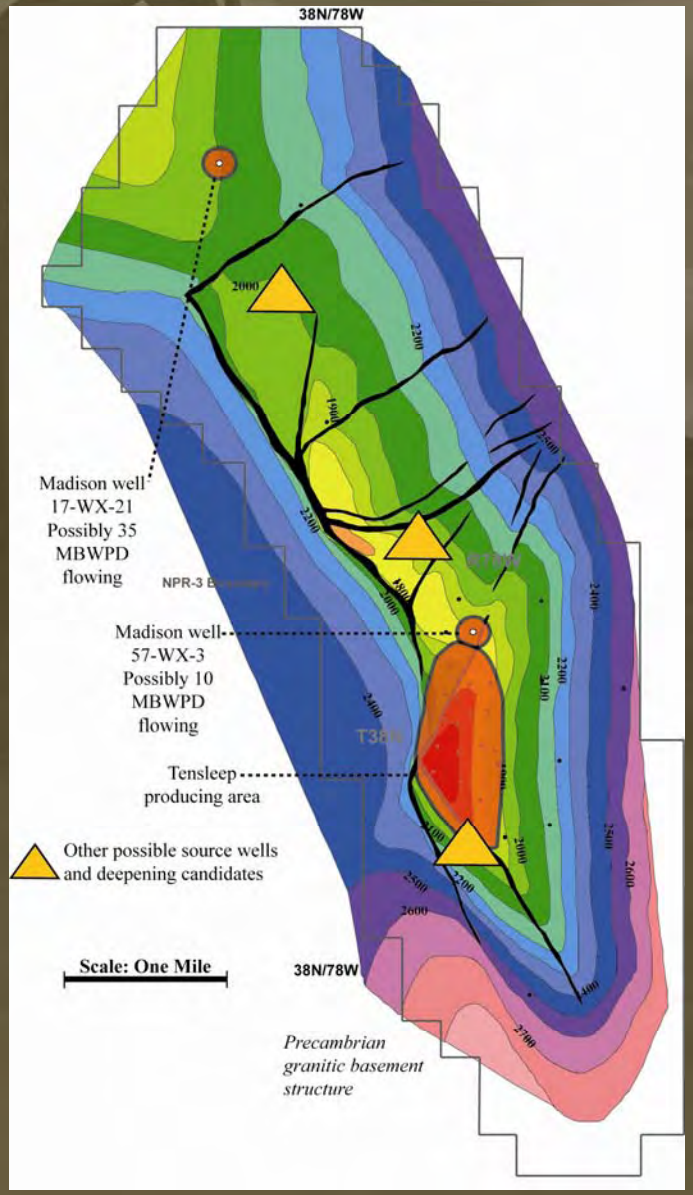


Low pressure is increasing faster and may be impacted by variable net injection



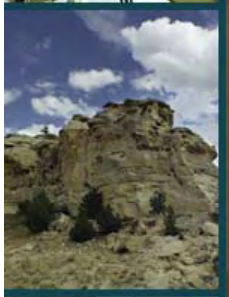
Rocky Mountain Oilfield Testing CENTER

Potential Geothermal Supply Wells

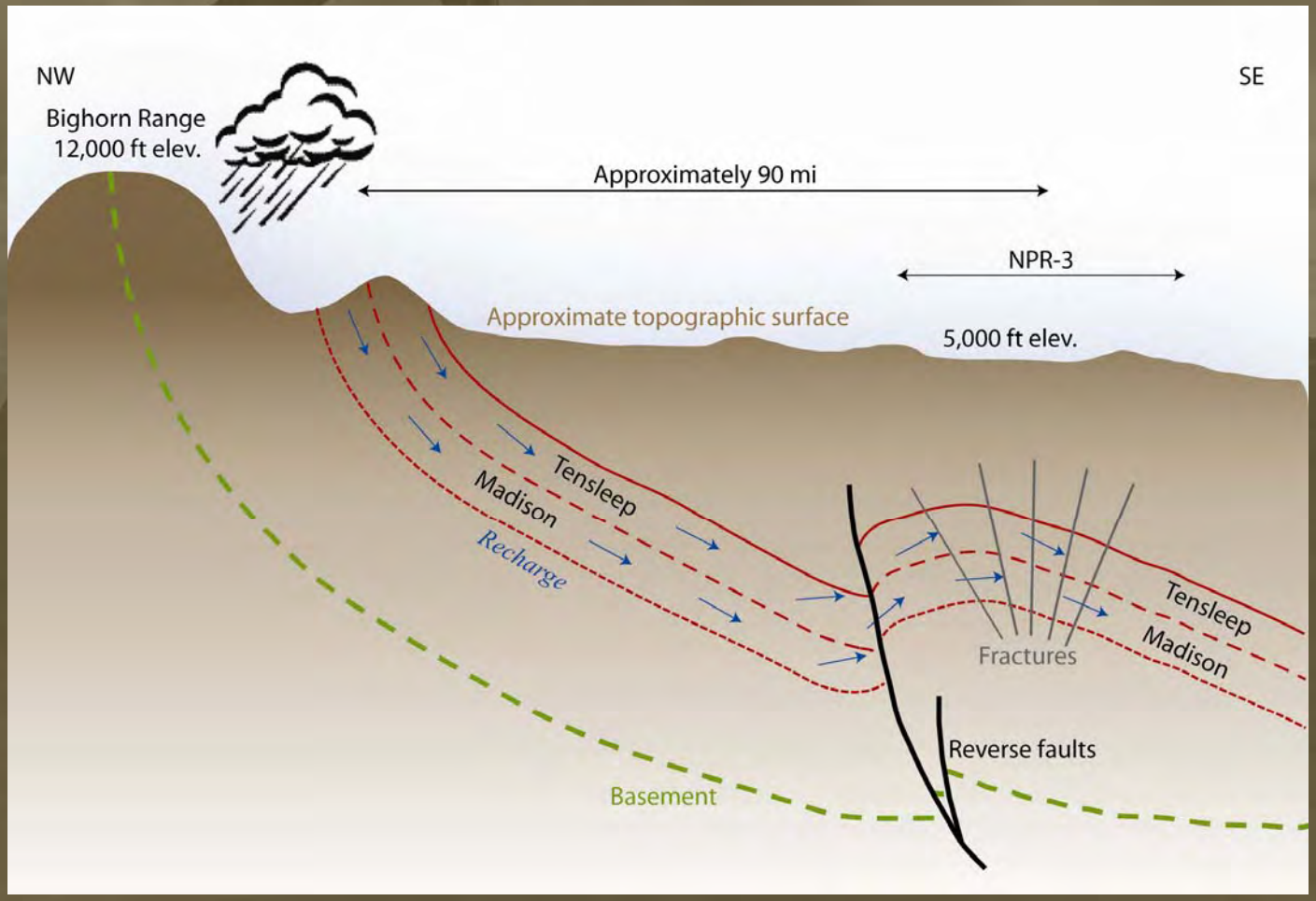


Projected Geothermal Potential

Well	Zone	Rate, MBWPD		Comments
		Low	High	
17-WX-21	Madison	20	25	Flowing
17-WX-21	Tensleep	4	10	Needs perforating
41-2-X-3	Tensleep	1	3	Flowing
41-2-X-3	Madison	6	12	Needs deeping
48-X-28	Tensleep	2	6	Flowing
61-2-X-15	Tensleep	2	6	Flowing
61-2-X-15	Madison	6	12	Needs deeping
57-WX-3	Madison	2	6	Flowing
Total New Flowing Production		43	80	
Total New Pumping Production		86	160	Assumed Double the Flowing Rate
Total of 12 current Section 10 Tensleep Wells		40	50	Pumping
All Potential Production		126	210	All on pump



NPR-3 Recharge System



Bad Blumau, Austria – 200 kW, 212°F

OEC Projected Performance

Flow Rate:	584,000 pounds per hour
Inlet Temperature:	170°F
Outlet Temperature:	152°F
Ambient Temperature:	50°F
Generator Gross Power:	180 kW
Net Power Output:	132 kW