

# EGS RESERVOIR PRODUCTION



ALTAROCK

ENERGY INC

# STATUS AND ACHIEVEMENTS

---

- ❑ TESTING AT SOULTZ – 6 month circulation test at >25 kg/s
- ❑ MULTIPLE PRODUCERS PER INJECTOR
- ❑ OPERATION OF LANDAU PROJECT – Enhanced natural fracture system in operation at ~70 kg/s since Nov. 2007 with no temperature drop
- ❑ PUMPED FLOW – Reduces water loss while increasing flow rate

# EXPERIENCE WITH EGS PRODUCTION

---

## PAST

- ❑ HIGH INJECTION PRESSURES DURING PRODUCTION TESTING RESULT IN HIGH WATER LOSSES
- ❑ WELL PAIRS LIMIT WATER RECOVERY AND ACCESS TO FRACTURED VOLUME
- ❑ COOLER ZONES CONNECTED TO FRACTURED VOLUME CAUSE RAPID TEMPERATURE DROP
- ❑ ATTEMPTS TO INCREASE FLOW RATES BY IMPROVING FRACTURE PERMEABILITY WITH PROPPANTS RESULT IN SHORT CIRCUITS

## CURRENT TECHNOLOGY

- ❑ LOWER INJECTION PRESSURE DURING TESTING REDUCE WATER LOSS
- ❑ LOWER INJECTION PRESSURES MEAN LOWER FLOW RATES – NEED PRODUCTION PUMPS
- ❑ MULTIPLE WELLS PER PRODUCER INCREASE FLOW AND REDUCE WATER LOSS
- ❑ CONTINUOUS MONITORING OF SEISMIC ACTIVITY TO DETERMINE RESERVOIR GROWTH

# ISSUES AND CHALLENGES FOR PRODUCTION OF EGS RESERVOIRS

---

- ❑ ROCK FLUID INTERACTION
  - DEPOSITION OF DISSOLVED SOLIDS
  - DISSOLUTION OF ROCK
- ❑ SHORT CIRCUITING
- ❑ HIGH TEMPERATURE PUMPING