

Geothermal vs. Oil and Gas: A Comparison of Drilling Practices

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Necessities for a Geothermal Resource.

- Heat
- A heat holding medium
 - “The Formation”
- A heat transporting medium
 - “Water”

Geothermal Environments

- Liquid-Dominated Reservoirs
- Vapor-Dominated Reservoirs
- Hot Dry Rock
- Geopressured-Geothermal Reservoir

Major Differences between Geothermal and Oil/Gas Wells

- Temperature
- Production pressures
 - For geothermal reservoirs pressures are very low
 - In some cases “sub-hydrostatic”
- Geothermal formations are often usually hard and abrasive
- Production rates
 - Very high for geothermal fluids
 - Produced fluids may be very corrosive

Temperatures

Basic Geothermal Reservoir Types

- Steam
 - 450-470°F
- Steam/Water
 - > 450°F
- High Temperature Water
 - < 350°F
- Low Temperature Water
 - < 350°F
- Very Low Temperature Water
 - < 212°F

Low Reservoir Pressures

**Geothermal Formations
are Hard and Abrasive**

High Production Rates of Potentially Corrosive Liquids

Conclusion

- Running of slotted liners.
- Scaling and corrosion from high temperature production fluids.
- Wellhead completion systems.
- Conventional fishing operations in a high temperature environment.
- Disposal of produced fluids.
- Well testing.
- Reinjection of geothermal fluids.
- Thermal stressing tubular goods by the repeated cycling of the well.
- H₂S gas production while air or aerated drilling.

Questions?