

# *Monitoring and Characterization Equipment Development at Idaho National Engineering and Environmental Laboratory*

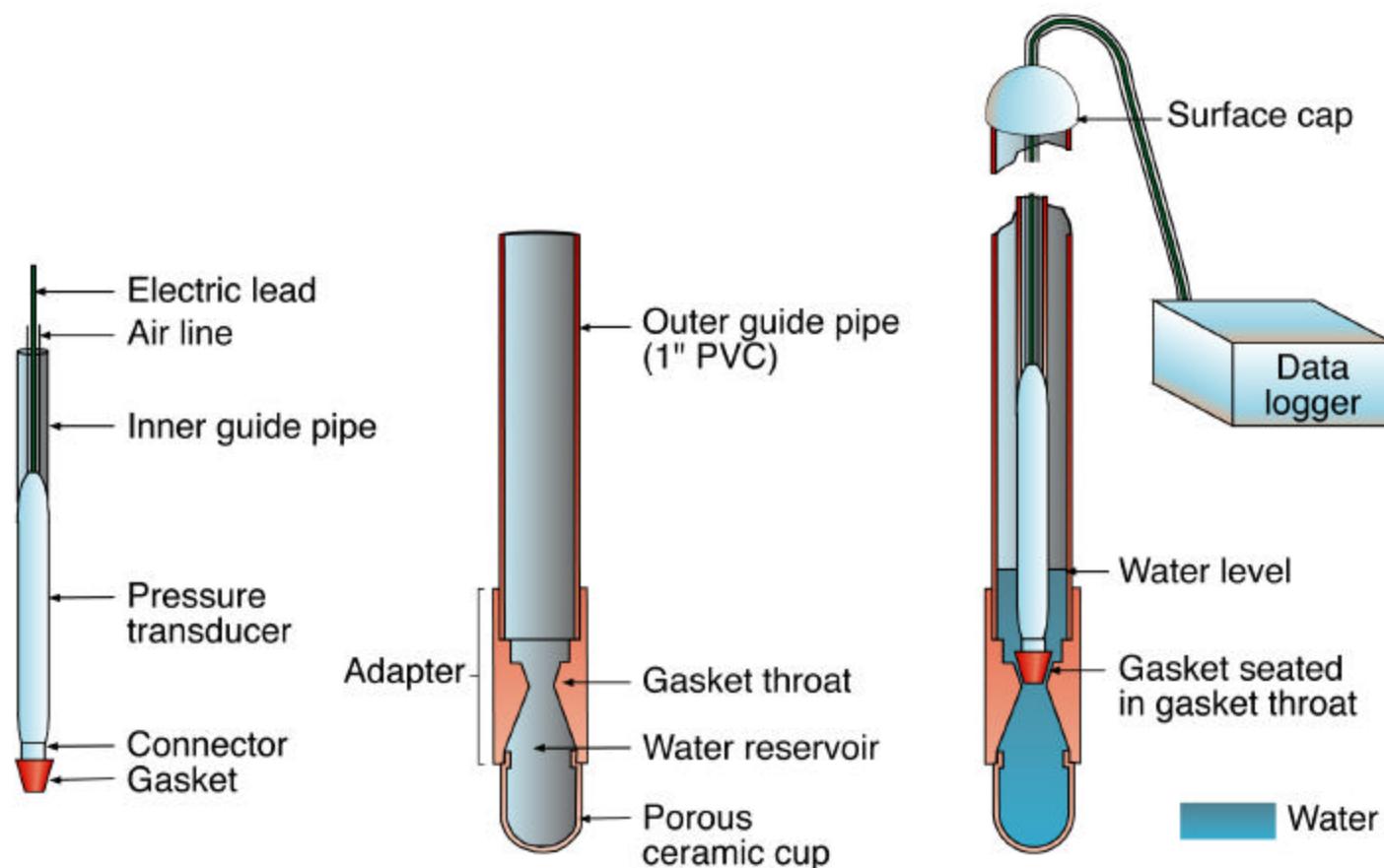
***Earl D. Mattson and James Buck Sisson***

January 19-20, 2000



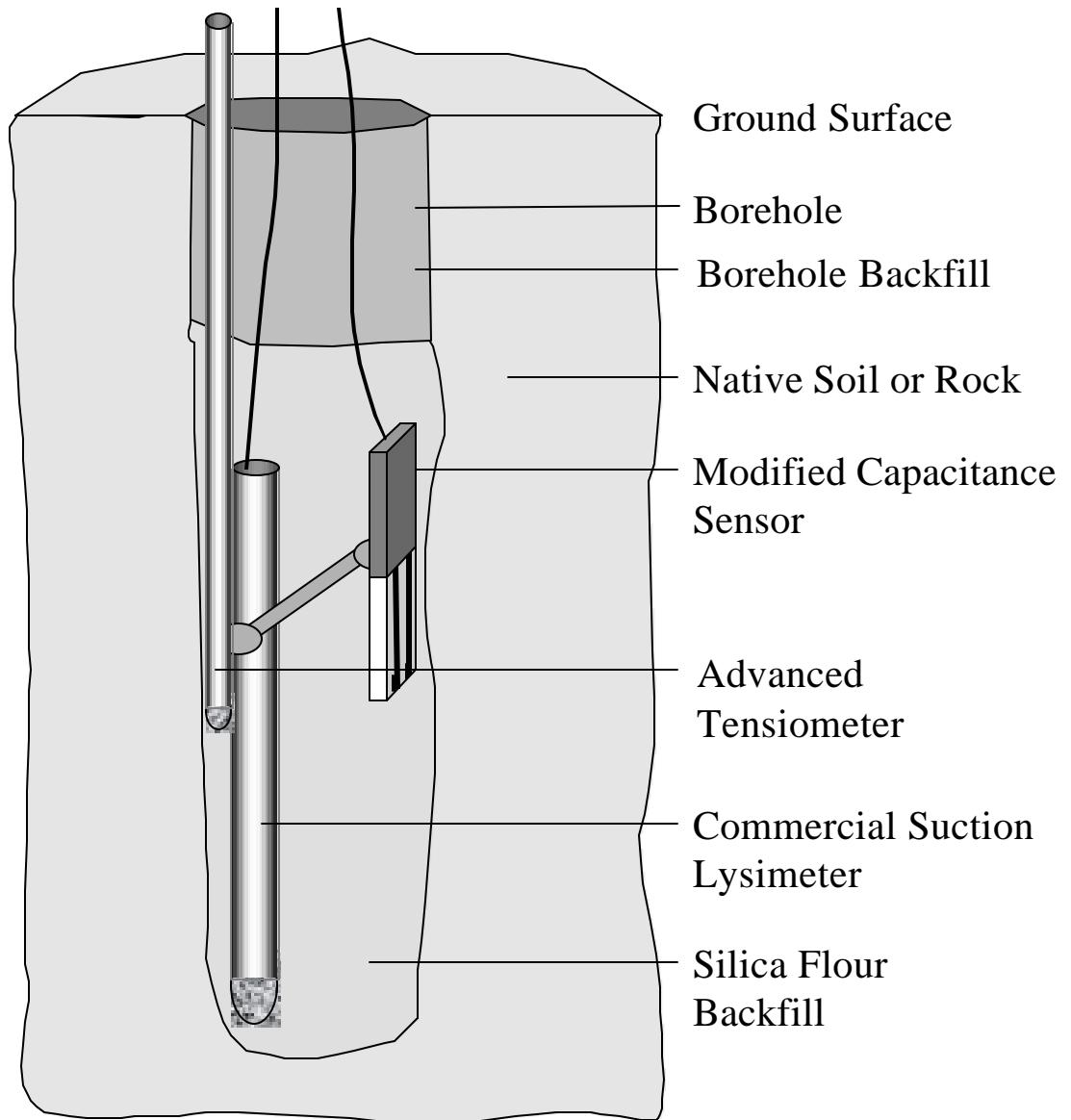
- Advanced Tensiometer
- Vadose Zone Monitoring System
- Exfiltrometer

# Internal Design of the Advanced Tensiometer

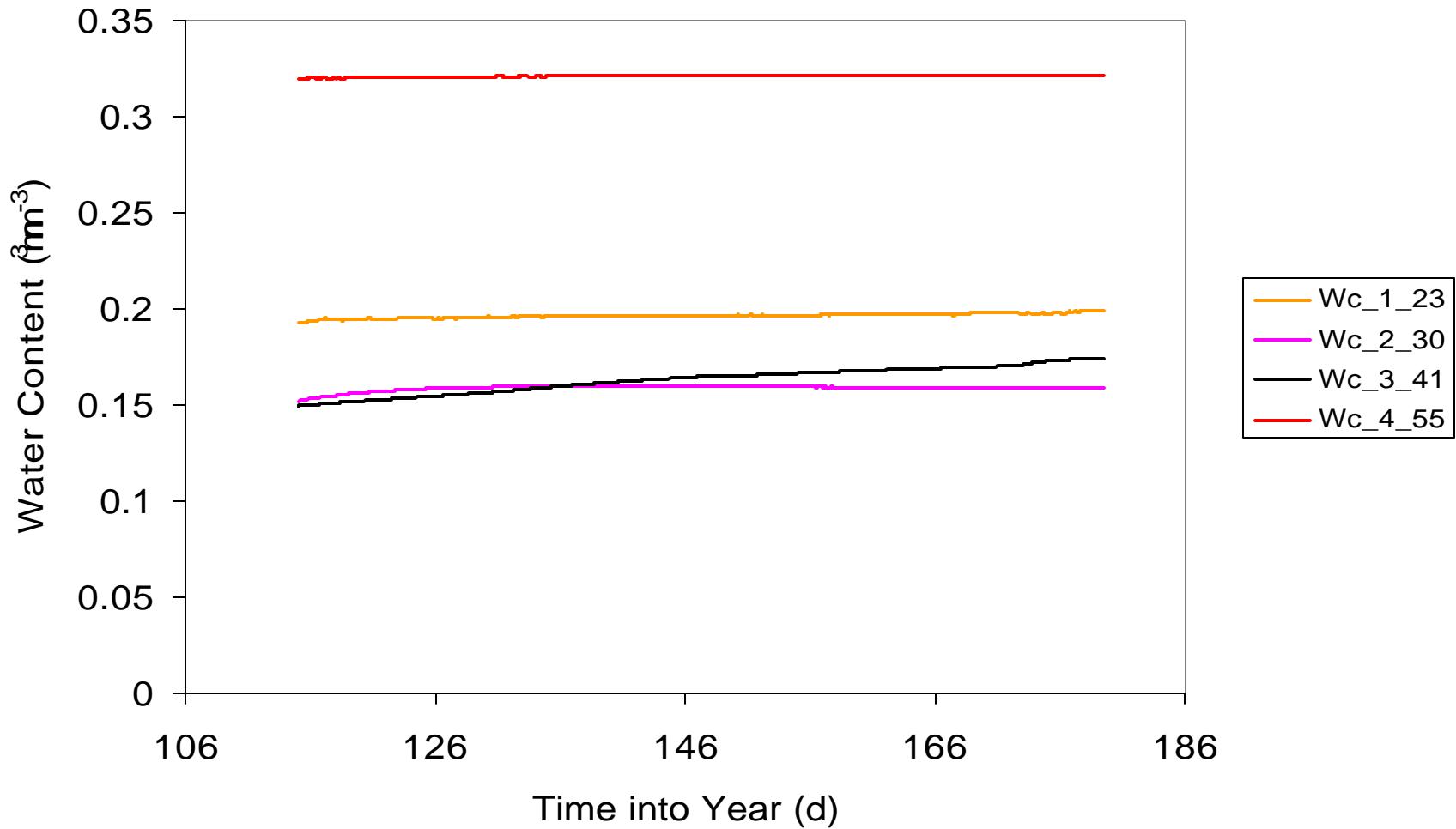


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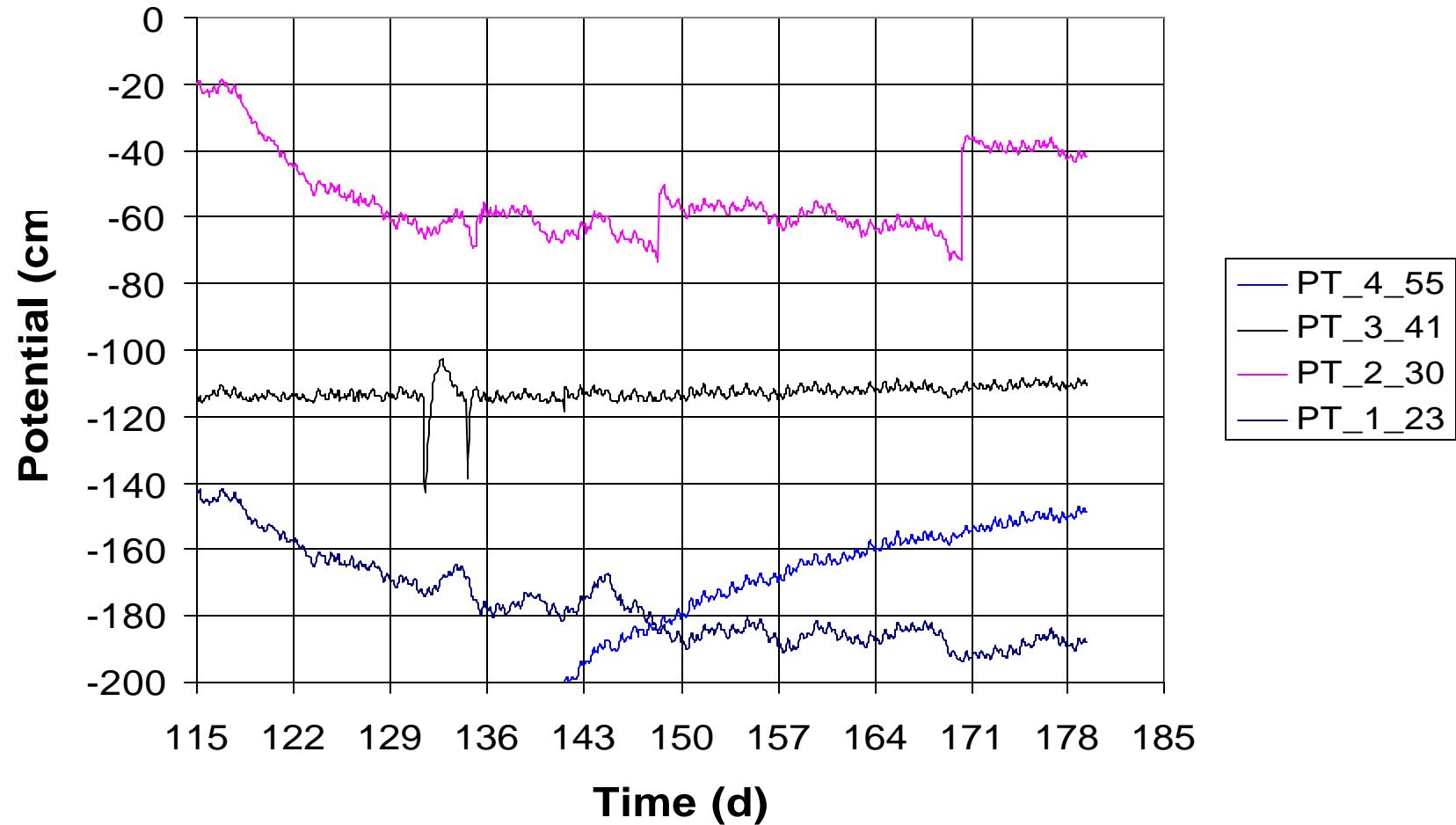
# Vadose Zone Monitoring System



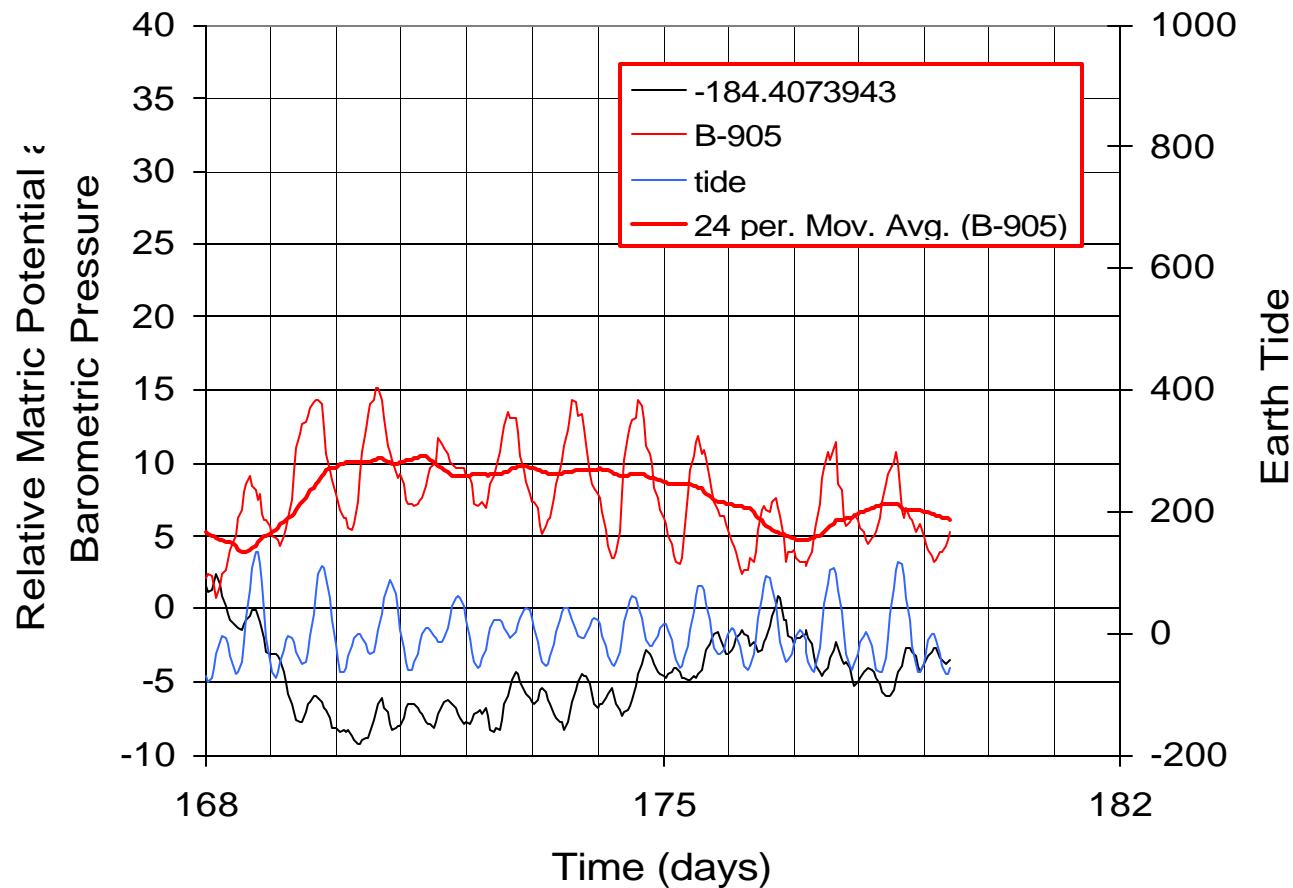
## SRS6 Water Contents



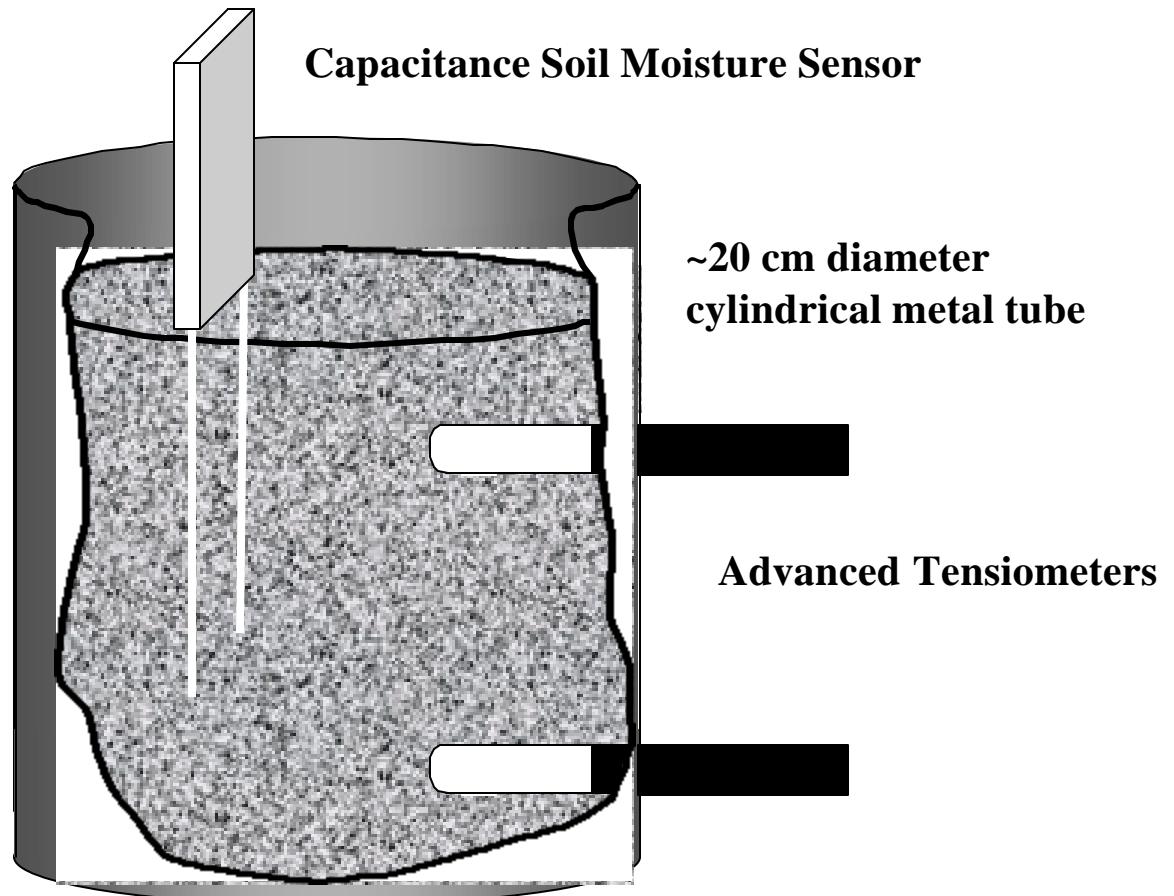
## SRS6 Water Potentials



### Comparison of Tensiometer, Barometric Pressure and Earth Tides

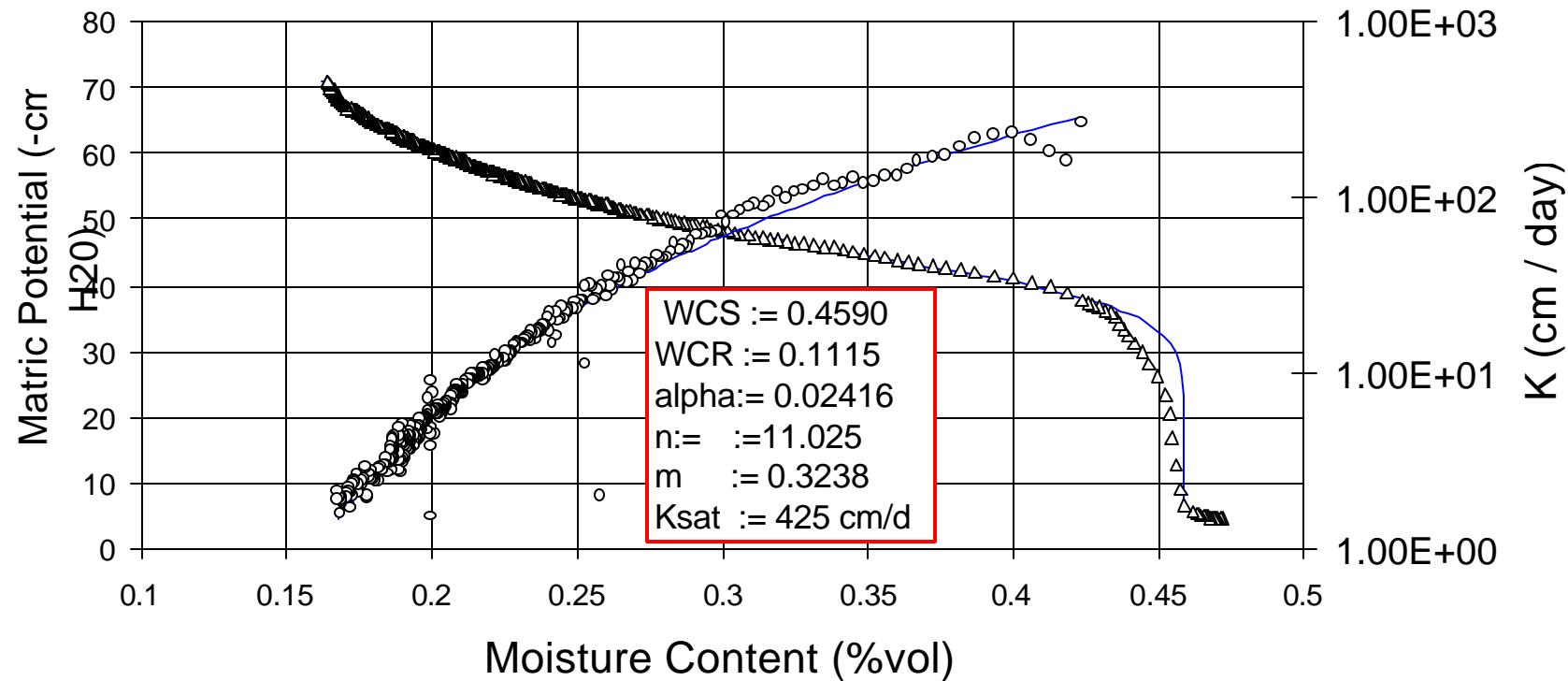


# Exfiltrometer

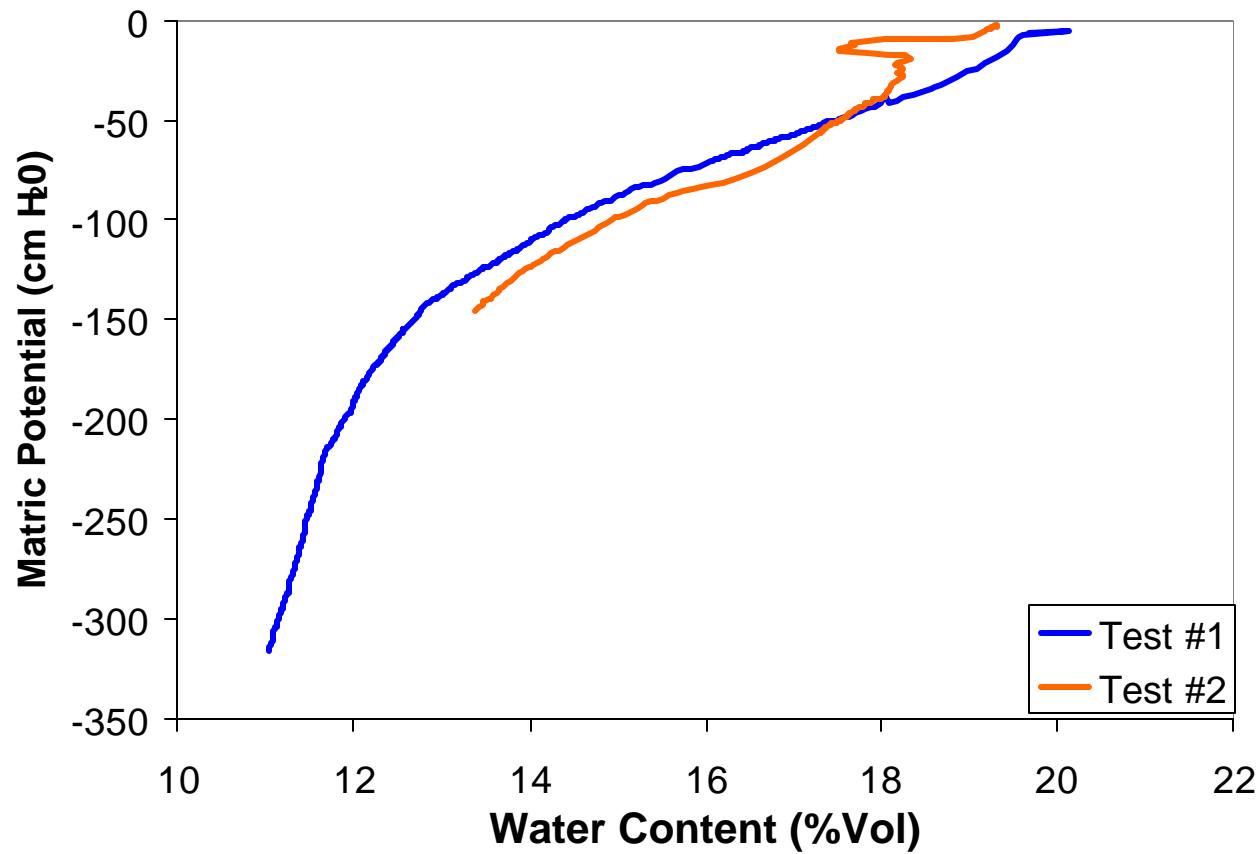


## Exfiltrometer Test: Dune Sand

### Aug. 1999



## SRS Moisture Release Repeatability Tests



# Summary

- **Advance Tensiometer**
  - *quick - stable response*
  - *applicable to any depth*
- **Vadose Zone Monitoring System**
  - *Precise Readings*
  - *possible in situ  $\mathbf{q}$ - $\mathbf{Y}$  data*
- **Exfiltrometer**
  - *relatively fast*
  - *both  $\mathbf{q}$ - $\mathbf{Y}$  and  $K$  -  $\mathbf{Y}$  data*

# *Application to Hanford*

- ***Advanced Tensiometer***
  - *will be able to provide  $\mathbf{Y}$  data as a function of time*
  - *will only give point measurements*
- ***Vadose Zone Monitoring System***
  - *limited applicability due to collapsing boreholes*
- ***Exfiltrometer***
  - *can provide both  $\mathbf{q}$ - $\mathbf{Y}$  and  $K$ - $\mathbf{Y}$  data*
  - *may be used for spatial variability studies*

