

# **Alternative Criteria To GWTT On The Geologic Subsystem**

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## **Outline**

- **Intent Of The GWTT Criterion**
- **Problems With Current Criterion**
- **Criteria For A New Criterion**
- **Example**
- **Summary & Conclusions**

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## Intent Of The GWTT Criterion

- Simple measure of performance
- Independent of any engineered barrier
- Ambient system
- Intuitive surrogate for risk
- Is it safe?

*Given that you are planing to dispose of radioactive waste in Yucca Mountain what assurance can you offer the public that the natural system offers adequate protection?*

## Problems With The Current Criterion

- Multiple interpretations possible
  - stakeholder point-of-view
- Independent of quantity
- Prolonged debate
- Independent of consequence

## Criteria For A New Criterion

- Explicitly address failure conditions
  - what can go wrong?
  - define failure
- Field testable hypotheses
  - can be refuted by data
- Stakeholder consensus
  - definition of failure
  - measure of failure
  - acceptable risk
- De-emphasis of complex models

## Example Of How A Criterion Could Be Set For Yucca Mountain...

- Define failure in context
  - groundwater transport of contaminants
- Necessary conditions (what could go wrong)?
  - source of water
    - infiltration
    - perched
  - contact with contaminant
    - quantity of water
    - residence time

## Example Of How A Criterion Could Be Set For Yucca Mountain...

- Necessary conditions (continued)
  - pathway to the environment
    - quantity
    - physical pathways
- Sufficient conditions
  - the fact that any one thing will go wrong does not constitute a failure

## Summary & Conclusions

- GWTT does not work
  - absence of mutually agreed to specificity
    - not unique to GWTT
- The conditions that would constitute a failure can be articulated
- The likelihood that those conditions exist is a function of site characterization
- The consequences of a failure can be estimated
  - human health effects
  - ecological effects

## Summary & Conclusions

- Risk-based approach
  - answer 3 questions
    - what can go wrong?
    - how likely is it?
    - what are the consequences?
- Stakeholder responsibilities
  - agree to acceptable risk
  - iterative re-evaluation of the criteria as information is gained by all parties to the decision