



U.S. Department of Energy
Office of Civilian Radioactive Waste Management



The Role of Analogues

Presented to:

Nuclear Waste Technical Review Board, Full Board Meeting

Presented by:

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Use of Natural Analogues

- **Identify dominant mechanisms**
- **Calibrate models (e.g., ASHPLUME)**
- **General synthesis/meta-analysis**



Peña Blanca, Nopal 1



Peña Blanca, Mexico

UO_{2+x} in welded silicic tuff,

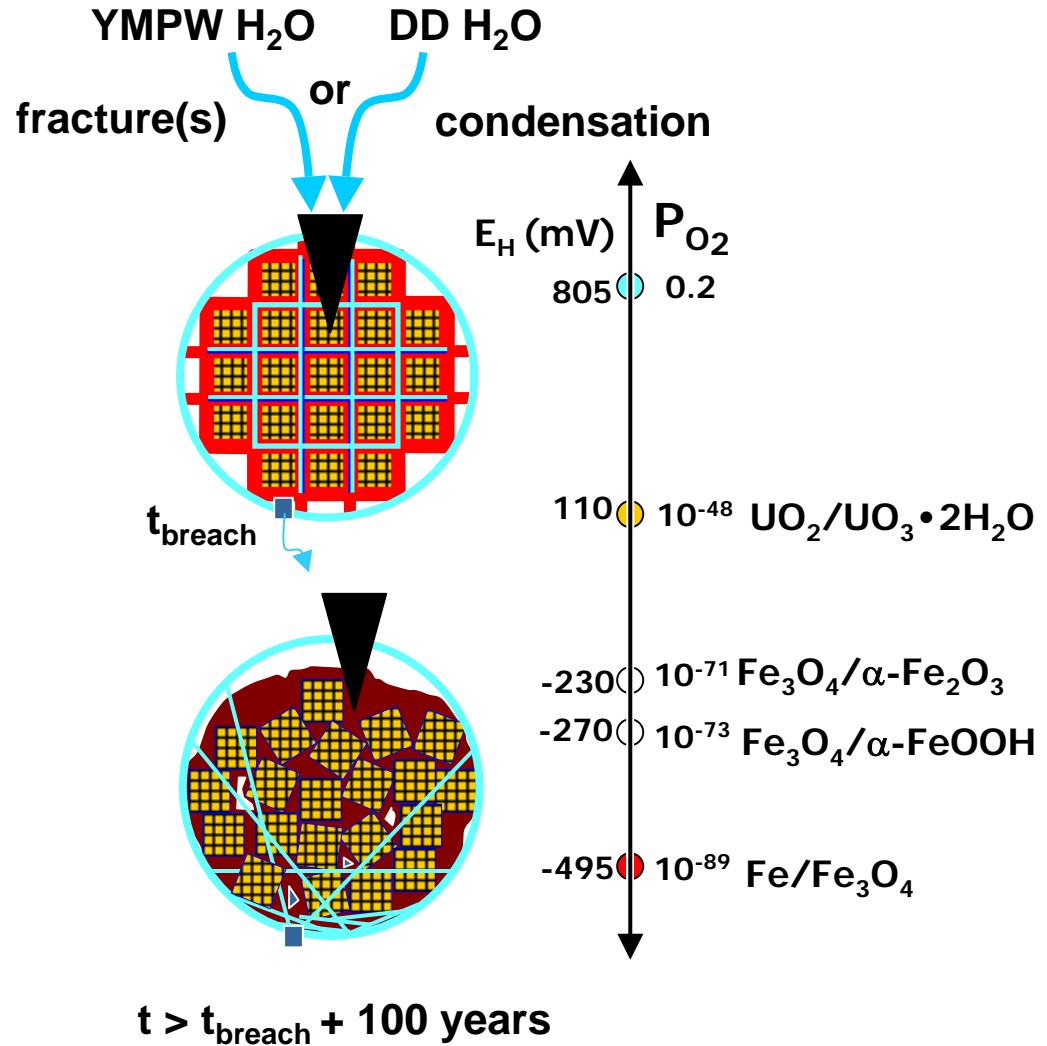
Unsaturated, chemically oxidizing

Alteration sequence similar to Argonne drip test

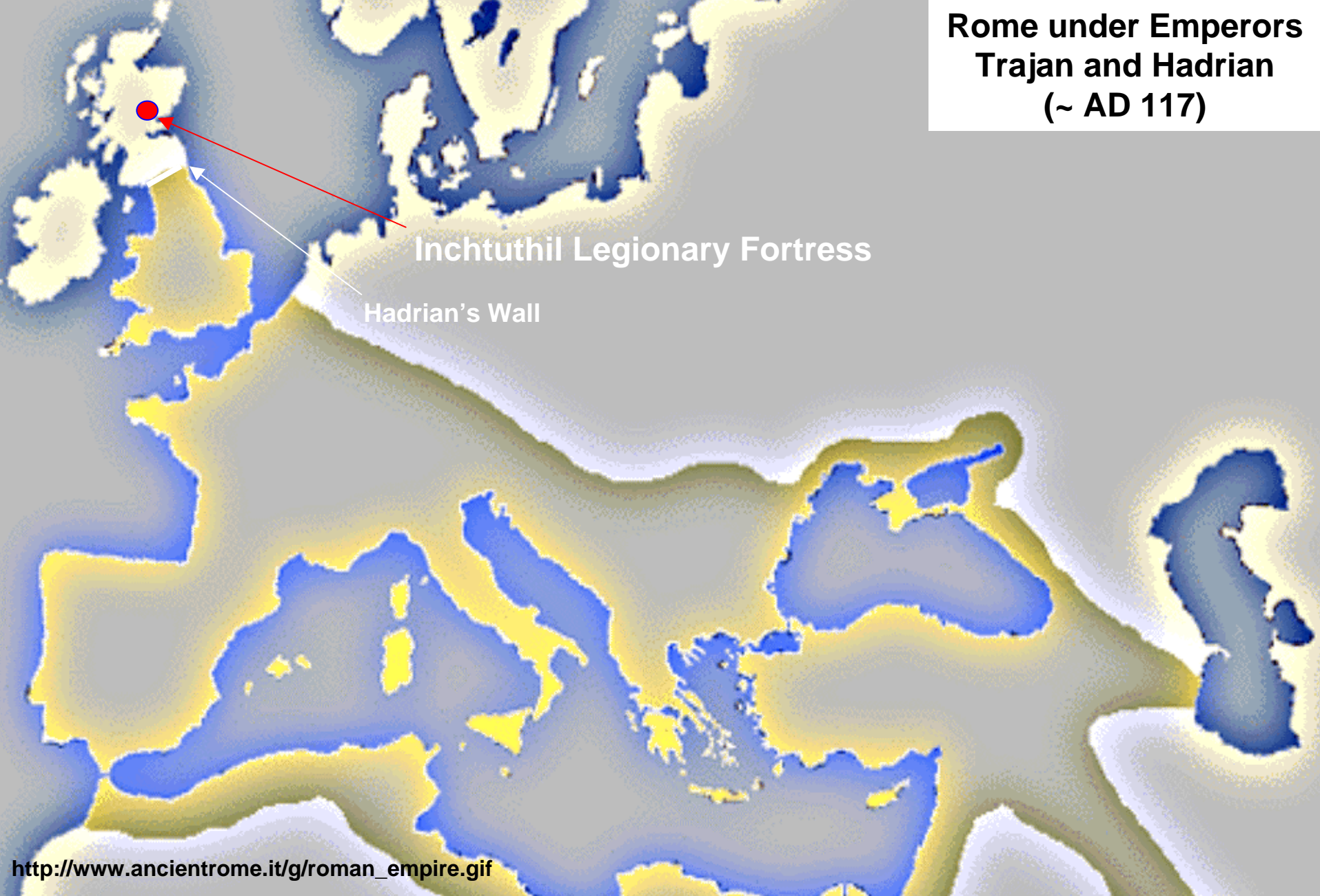


Inside the Package

Fe/U ~ 7



**Rome under Emperors
Trajan and Hadrian
(~ AD 117)**



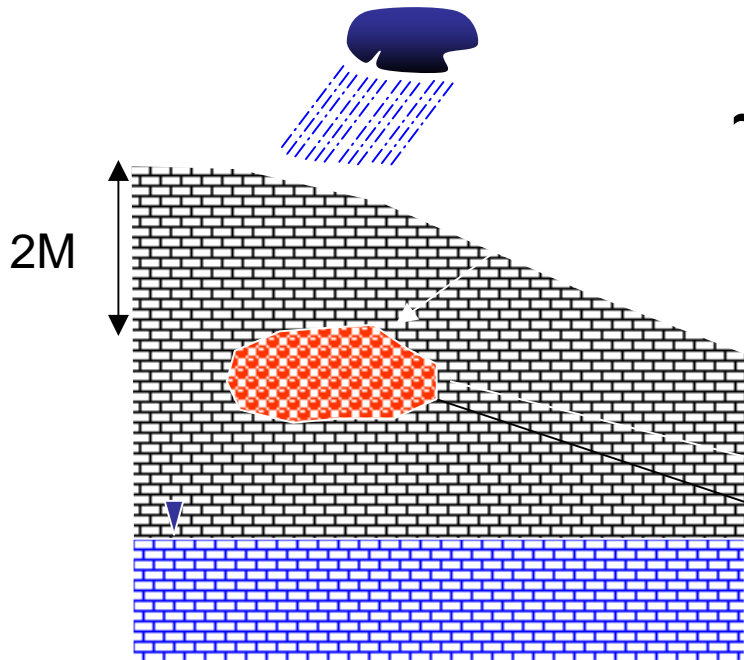
Inchtuthil Legionary Fortress

Hadrian's Wall

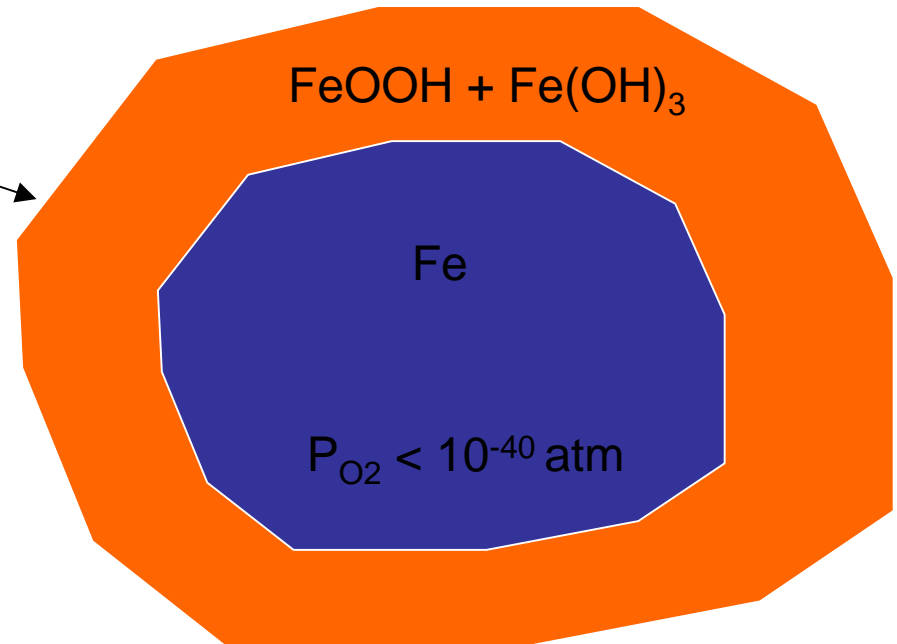
http://www.ancientrome.it/g/roman_empire.gif



Buried Nails at Inchtuthil



**~ 70 tons (> 1 million nails),
Buried in 84 AD,
Excavated in 1960s**



Technetium Uptake by Iron-Based Materials

