United States Nuclear Regulatory Commission

General Approach for NRC Staff Review of the Performance Assessment of the West Valley Site

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Presentation Outline

- Brief site overview
- Regulatory framework for Performance Assessment (PA)
- Expectations for DOE's PA
- Plan for NRC staff review of DOE's PA
  - NRC independent PA development and assessment activities

Brief Overview- West Valley Site

- Complexity from a performance assessment perspective is high.
- Significant potential source terms for contamination including:
  - Process Building
  - High-Level Waste (HLW) tanks
  - NRC-licensed Disposal Area (NDA)
  - Sr-90 Plume
  - State-licensed Disposal Area (SDA)
  - Low-level Waste Treatment Facility/lagoons
  - Cs Prong

Looking South

Brief Overview- West Valley Site

- Site is separated into a North Plateau and a South Plateau primarily based on hydrogeology considerations.
- Receptor considerations are different for the different waste management areas based on the availability of water (e.g., water availability may be limited on the South Plateau).
- The site experiences relatively high rates of erosion.
- Engineered barriers are expected to be used as part of the site decommissioning.

Regulatory Framework for PA

- PA must satisfy the requirements of 10 CFR Part 20, Subpart E, the License Termination Rule (LTR)
- LTR has provisions for:

  Unrestricted release

  - no controls or maintenance
  - 25 mrem annual public dose limit

  Restricted release

  - institutional controls limiting use of the site and/or providing for maintenance and monitoring,
  - 25 mrem annual public dose limit,
  - 100 [or 500] mrem annual public dose assuming the institutional controls fail

  Alternate criteria

Regulatory Framework for PA

- Guidance provided in:
  - NUREG-1757 Consolidated NMSS Decommissioning Guidance
  - NUREG-1573 A Performance Assessment Methodology for Low-Level Radioactive Waste Disposal Facilities

- Guidance stresses reasonably foreseeable scenarios and current regional practices (implement the LTR analysis approved by the Commission).

NRC Expectations for DOE's PA

- NRC expectations for DOE's PA include:
  - incorporate as much realism as practical.
  - provide a liberal consideration of uncertainty.
  - provide probabilistic analyses. If the analyses are deterministic they should include numerous sensitivity and uncertainty analyses.
- DOE's models are mostly internally developed for this project, therefore QA is important.
  - DOE should provide information on confidence building including software and calculation verification and model support.
- Receptors should be based on reasonably foreseeable scenarios and current regional practices.

NRC Expectations for DOE's PA

- Engineered barriers may perform key functions at the site (grout, drainage barriers, slurry walls, french drains). Technical basis is essential for:
  - as-emplaced performance
  - long-term performance

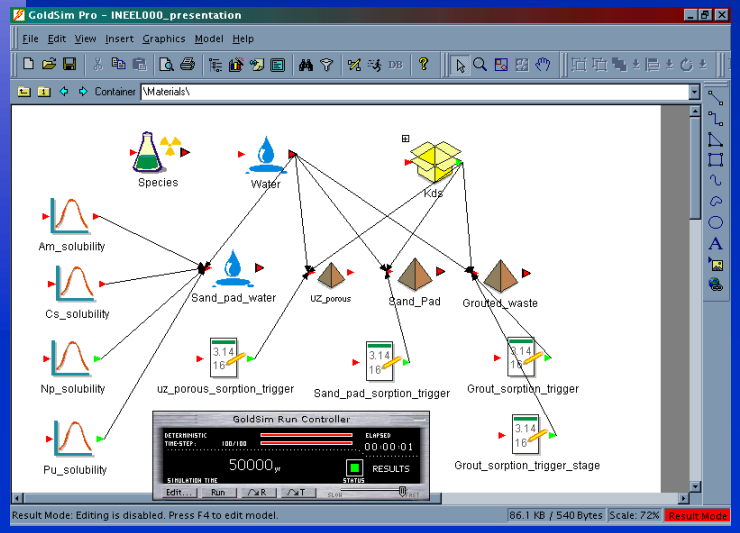
- Erosion rates may be high enough that waste could be exposed.
  - rigorous consideration of uncertainty in the long-term prediction of erosion rates.
  - consideration of how erosion may impact receptor scenarios

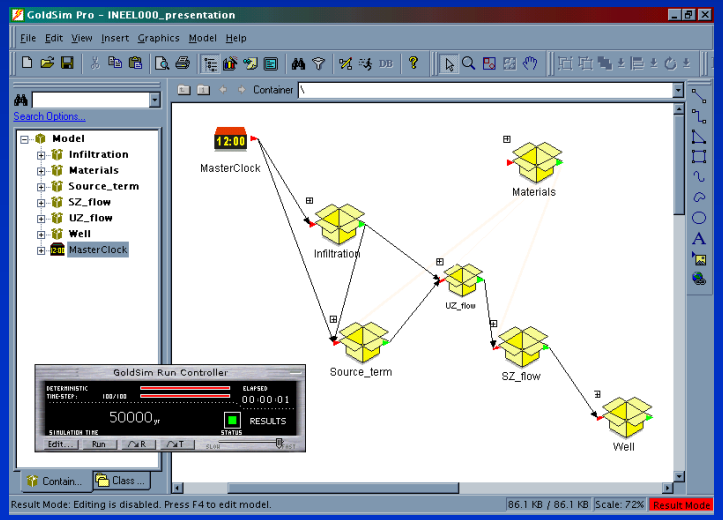
Plan for NRC Staff Review of DOE's PA

- Staff from EPAD and DD will take part in the review.
- The Center for Nuclear Waste Regulatory Analyses will provide technical support via a contract with the NRC.
- Staff have already begun reviewing draft sections of documents describing the performance assessment for the EIS.
- The review will be risk-informed.

Plan for NRC Staff Review of DOE's PA

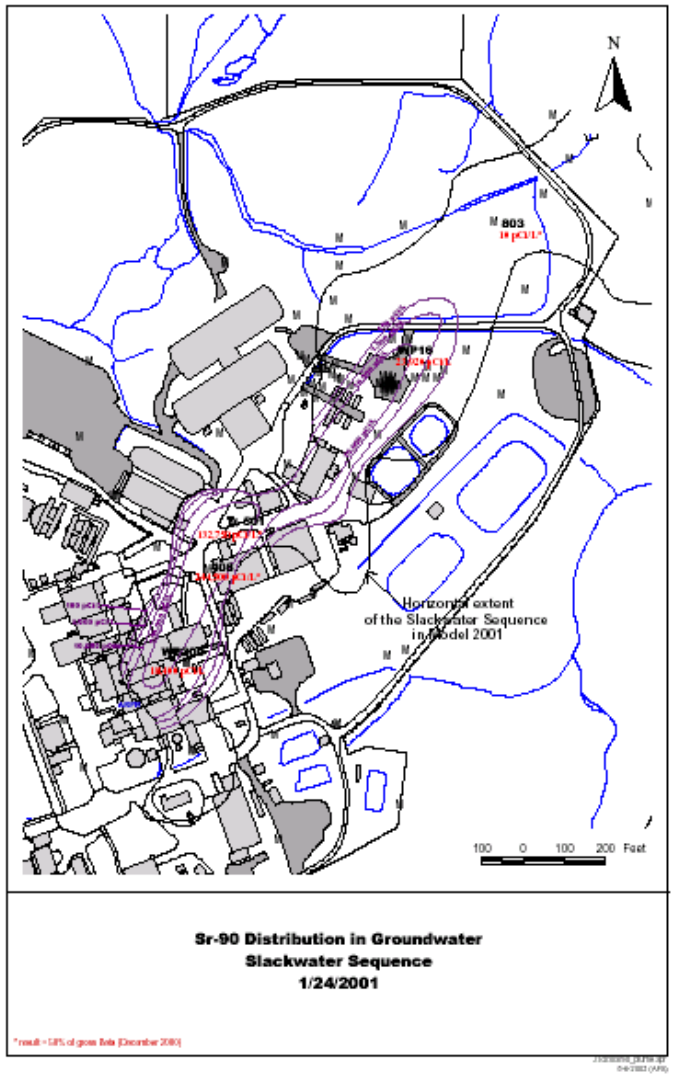
- Staff will likely begin development of their own performance assessment model of the site with the GoldSim software package (Summer 2004).
- Similar to what was done for the staff review of HLW tank closure at the INEEL, staff will use the model to risk-inform their review to the extent practical.

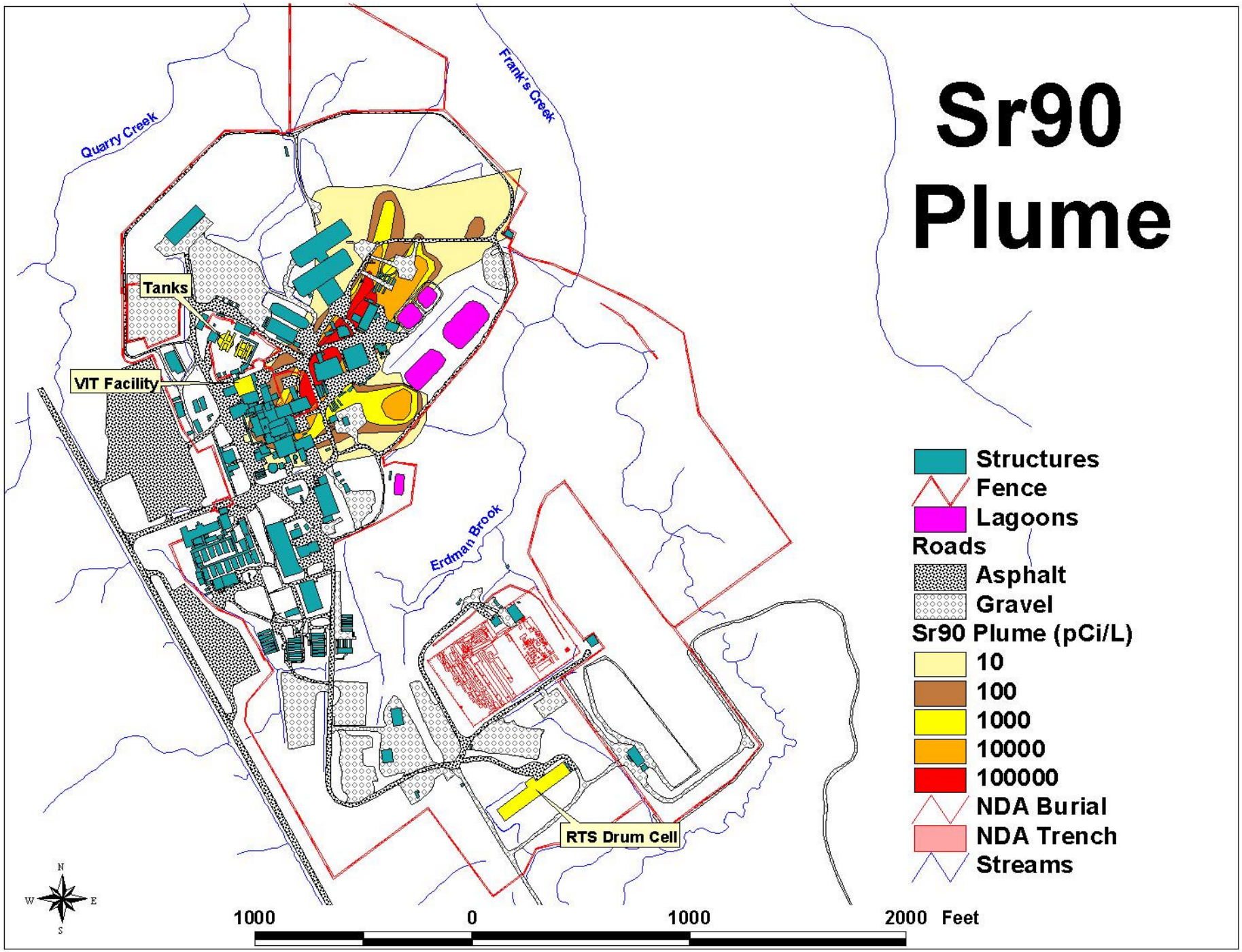




Example of Complexity at the West Valley Site

- Sr-90 plume originates from a corner of the process building.
- Groundwater concentrations exceed 100,000 pCi/L.
- What are appropriate receptors, controls, and/or remediation necessary for the Sr-90 plume?




Sr90 Plume
Quarry Creek
Frank's Creek
Erdman Brook
Tanks
VIT Facility
RTS Drum Cell
Structures
Fence
Lagoons
Roads
Asphalt
Gravel
Sr90 Plume (pCi/L)
10
100
1000
10000
100000
NDA Burial
NDA Trench
Streams
1000
0
1000
2000 Feet
N
W
E
S

Conclusions

- Review of the West Valley PA is expected to be very difficult
- The review will be performed in a risk-informed manner
- NRC staff will be supported by technical experts at the CNWRA
- NRC staff will likely develop an independent performance assessment model of the site