

# ***Performance Assessment Scoping - Hanford Example***

Linda Suttora

Office of Environmental Compliance DOE-HQ  
Waste Processing Technical Exchange 2010



***EM*** *Environmental Management*

safety ❖ performance ❖ cleanup ❖ closure

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# *Scoping of the Hanford PA*

- Reason for new Hanford C Tank Farm PA
- Performance Assessments (PA) Process
- Typical PAs development process
- Hanford PA development process (mod to SRS process)
- Significance of new process



# ***New Hanford C Tank Farm PA***

- Hanford initiating regulatory process to close tanks
- Process involves many steps:
  - Performance Assessment
  - State required closure plans
  - EPA required CERCLA documents
  - Waste Incidental to Reprocessing Determination
  - DOE required closure plans



# *Requirement for PA*

- **435.1-1.IV. P.(2) Performance Assessment**
- Site specific analysis of physical and chemical mechanisms that control the migration of radioactive materials through the environment
- Intended to protect potential human exposure
  - Includes activities that future members of the public may conduct (e.g., drinking water, recreational activities) that could potentially result in exposure to the radioactive material
- PA expected to provide a reasonable expectation that the performance objectives will be met
  - Results expected to specify design (depth to waste, thickness of concrete), operational controls (WAC), and closure requirements (cap, etc)



# *PA Performance Objectives*

- Dose to representative public limit is 25 mrem at a point of assessment from all exposure pathways
- Separate analysis of air pathway limit is 10 mrem
- Radon release less than average flux of 20pCi/m<sup>2</sup>/s or 0.5pCi/l at the boundary



# *Analyses in a PA*

- Calculate performance for a 1,000 year period after closure (NRC guidance says 10,000 years)
- Reasonable activities of the critical group
- Point of Compliance
- Natural Processes
- Dose Conversion Factors
- Sensitivity/Uncertainty Analysis
- Water Resources Analysis
- Intruder Analysis



# *Typical DOE PA Development*

- Subject Matter Experts develop framework
- Bring in modelers
- PA completed by contractors and submitted to DOE Field for review, comments incorporated
- DOE HQ coordinates Low level waste Federal Review Group (LFRG) review
- DOE HQ management approve PA if LFRG recommends, PA not public document
- PA analyses used for determining construction design, WACs, etc



# ***New Style PA Development***

**So far, has only been used when intent is to make a waste incidental to reprocessing determination**

- Assemble group of NRC technical staff, regulators and other stakeholders to agree on assumptions to use in PA development such as: Point of Assessment, Natural Processes, Soil Inventory, etc
  - Established ground rules of how business will be conducted and a 2 year process
- Follow steps to develop PA and submit to LFRG
- After LFRG review complete, submit to stakeholders for review, incorporate comments and send out for 2<sup>nd</sup> review
- Incorporate additional comments, as appropriate,
- PA is considered complete only after these steps



# *Hanford C Tank Farm Issues*

0	Goal/Process	2/24/09
1	Residual Inventory	5/5/09
2	Assessment Context/ General Conceptual Model	9/1/09
3	Soil Inventory	10/27/09
4	Engineered System #1	1/26/10
5	Review of Previously Proposed Inputs/ Assumptions and Proposed FEPSb Process	3/30/10
6	Natural System	5/25/10
7	Engineered System #2	7/27/10
8	Exposure scenarios	9/28/10
9	Numeric codes	1/25/11
10	Ecological Risk	5/17/11
11	Results from Initial Model Results	8/30/11
12	Results from Final Model Results	1/24/12



# *Who Is Involved*

- DOE-Office of River Protection and contractors
- DOE Richland Operations Office and contractors
- DOE-Headquarters
- Nuclear Regulatory Commission
- Environmental Protection Agency, Region X
- State of Washington Department of Ecology
- State of Oregon
- Yakama Tribe representatives
- Nez Perce Tribe representatives
- Confederated Tribes of the Umatilla representatives
- Other stakeholders invited to observe



# *Significance of PA*

- Closing tanks requires complex analysis of technical issues
- Found that assumptions use in PA development of interest to stakeholders
- Found great regulator and stakeholder interest in contributing to development of assumptions through conducting a similar process at SRS
- Gain credibility of process but also increased recognition of DOE expertise
- Scoping increases timing of initial activities but decreases acceptance time
- Subsequent documents (Waste Incidental to Reprocessing Determination Basis) rely on accepted document

