LSNReviews

From: John Bradbury
Sent: Friday, March 07, 2008 4:35 PM
To: 'LSN Reviews'
Subject: Fwd: Re: HLWRS Management Board Meeting(6/8/2004)
Attachments: RepVol_ver3.wpd

>>> Timothy McCartin 06/08/2004 7:25:28 AM >>>
All:

I understood that I would be giving additional comments on the groundwater presentation at todays Board meeting - my comments are attached.

Tim

>>> Kien Chang 06/07/04 04:43PM >>>
Attached is Bradbury's presentation file (.ppt).
For telephone call-ins, the bridge no. is 800-638-8081, pass code: 6612#

Meeting time is rescheduled because of conflict with other commitments. Please note the new time now is 10:00 AM to Noon EST.

Attached is a draft agenda for the Board's next meeting. Please note that John Bradbury will re-brief the Board on Ground Water Standard. If you have additional agenda items for this or future meetings, please send them to me.
I also attached a file for our previous Board meeting. This file serves as a record for all " **outcomes** " of the items we went through in that meeting. I will keep this record for **one year** . If you find any discrepancies in the " **outcomes** " of any discussed items, especially the ones affecting any action from or for you, please let me know so that I can correct the record.

Ground Water Protection Principles

- Releases from Yucca Mountain disposal system will not cause level of radioactivity in representative volume to exceed the specified limits

- Method provided to determine average concentrations for comparison with regulatory limits
  - assure the highest concentration portion of any contamination plume is included
  - estimates effect of radionuclide contamination on the water volume

- Representative volume is 3000 acre-feet **per year**
  - dimension of representative volume determined by "well capture zone" or "slice of the plume"

Implementation of Ground Water Protection Calculation

- Dimensions of representative volume determine concentration of radionuclides
  - fraction of releases (or plume) contained within representative volume determined by comparison of plume dimensions and dimensions of representative volume
  - 3000 acre-feet/year specified as representative volume in part to not require determination of concentrations in smaller volumes (i.e., volumes of water less than 3000 acre-feet/year) that could be difficult to defend based on characterization and modeling uncertainties

- If DOE estimates a large fraction of the plume is contained within the representative volume the staff need only do a limited review
  - DOE and NRC currently assume all releases are contained in the representative volume (i.e., annual releases into the accessible environment are completely contained within the representative volume of 3000 acre-feet per year)
  - estimating the average concentration within 3000 acre-feet per year is not affected by the representative volume dimensions

- If DOE were to assume a significant fraction of the plume were <u>not</u> contained in the representative volume a more detailed review would be necessary
  - understand the basis for estimating the dimensions of the plume are larger than the dimensions of the representative volume
  - assure the highest concentration portion of plume is included in the representative as required by rule

Implementation Examples

1) Annual releases of radionuclides to the accessible environment results in plume dimensions that are larger than the representative volume dimensions

   - assuming entire annual release is contained within the representative volume is conservative (i.e., average concentration in representative volume is larger)

2) Annual releases of radionuclides to the accessible environment results in a plume with essentially the same dimensions as the representative volume

   - average concentration is based on entire annual release contained within the representative volume 0f 3000 acre-feet/year

3) Annual releases of radionuclides to the accessible environment results in a plume with dimensions smaller than the dimensions of the representative volume

   - average concentration based on entire annual release contained within the representative volume of 3000 acre-feet/year (i.e., highest concentration portion is included in representative volume of 3000 acre-feet/year

   - average concentration within 3000 acre-feet/year is determined by the quantity of radionuclides in the representative volume not the concentration within the plume (note: the rule acknowledges that there would be large differences in concentrations within the representative volume - such as 1000 fold variation)

Should multiple years of releases be assumed to be contained within the representative volume of 3000 acre-feet/year when the plume dimensions are less than 3000 acre-feet/year?

- Assume a particular estimate of the annual release of radionuclides into the accessible environment was contained in 100 acre-feet (i.e., 30 years of releases would be required to total 3000 acre-feet); if 30 years of releases were introduced into a volume of 3000 acre-feet to determine a concentration then:

  - the "effective" representative volume is now 100 acre-feet **per year** - EPA considered and rejected a representative volume of 120 acre-feet per year as too small a value for meaningful calculations

  - consideration of multiple years in this manner would render the all-pathway individual dose limit as completely meaningless (i.e., the all-pathway dose estimate would need to meet a limit of 0.007 mrem/yr for I-129 in order that the ground water protection limits would be met)
    [note: the calculation of dose under the individual protection limit as discussed in the Statement of Considerations for Part 63 would be determined by dividing the annual releases by the water demand]

- Assume the releases from Yucca Mountain are extremely small (e.g., one leaking waste package) it might be estimated that 10,000 years of releases into the accessible environment would be required to cumulate 3000 acre-feet of contamination in the accessible environment

  - would it be reasonable to require the cumulative releases over 10,000 years be assumed contained in 3000 acre-feet and the concentrations meet the ground water protection limits?

Inclusion of Multiple Years of Releases in 3000 Acre-feet

1) Not consistent representative volume specified at 3000 acre-feet **per year** (not meant as a cumulative release limit)

2) Results in a more stringent standard as the overall performance of the repository improves

3) Renders the all-pathway individual dose limit meaningless