Message

From: Gallo, Patty (CONTR) [Patty.Gallo@lm.doe.gov]
Sent: 5/2/2017 11:07:53 PM
To: 'Spreng - CDPHE, Carl' [carl.spreng@state.co.us]
CC: Moritz, Vera [Moritz.Vera@epa.gov]; lindsay.masters@state.co.us; Murl, Jeffrey [Jeffrey.Murl@lm.doe.gov]; Surovchak, Scott [Scott.Surovchak@lm.doe.gov]; Kaiser, Linda (CONTR) [Linda.Kaiser@lm.doe.gov]; Ward, David (CONTR) [David.Ward@lm.doe.gov]
Subject: RE: List of research for discussion later this morning

Thanks Carl.

Patty

Patricia Gallo
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NAVARRO

From: Spreng - CDPHE, Carl [mailto:carl.spreng@state.co.us]
Sent: Tuesday, May 02, 2017 5:02 PM
To: Gallo, Patty (CONTR)
Cc: Moritz, Vera (Moritz.Vera@epa.gov); lindsay.masters@state.co.us; Murl, Jeffrey; Surovchak, Scott; Kaiser, Linda (CONTR); Ward, David (CONTR)
Subject: Re: List of research for discussion later this morning

Patty,

Here's one of the articles I referenced. I'll look for and forward others when I find them. The significant quote is:
"The specific activity of the PuO2-contaminated dust (soil) at Rocky Flats is orders of magnitude lower than for pure PuO2 so that large numbers of dust particles must be inhaled to lead to significant radiation exposure."

When you ask Ian to contact Annie K., I'd asked him to confirm our assumptions:
1) Colloidal transport of Pu particles is possible in the subsurface at Rocky Flats, but it would be a minor contributor to overall Pu transport.
2) Groundwater monitoring does not demonstrate colloidal transport.
3) Even if colloidal transport is occurring, the Pu particles would end up in surface water where the Pu content is continuously monitored.

Carl

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On Tue, May 2, 2017 at 9:22 AM, Gallo, Patty (CONTR) <Patty.Gallo@lm.doe.gov> wrote:

All:

Below is a list of relevant citations from the DU Law stakeholder input letter that I would like to discuss later this morning. I have grouped them into broad categories and included a brief summary of the input associated with the citation in parenthesis following the citation. Based on our last meeting, my understanding is that in Appendix I of the FYR report, we want to include a general response that indicates we reviewed the relevant research and it does not affect the protectiveness of the site. DOE would like us to provide backup information and our rationale for this conclusion for each citation for the project files.

I've also included Carl's email from earlier this year regarding the DU Law input letter (following the list of citations).

Cleanup

- John Abbotts *Remediation, Land Use, and Risk at Rocky Flats, and a Comparison with Hanford,* Vol. 21(3) Remediation, 145, 151 (July 2011) (RFCA and political liabilities for DOE)

- Theresa Satterfield and Josh Levin, *Risk Communication, Fugitive Values, and the Problem of Tradeoffs at Rocky Flats*, A Report for the U.S. Department of Energy Low Dose Radiation Research Program, 12/6/02, p. 14-15. (Tradeoffs during cleanup)

- Rocky Mountain Peace and Justice Center by Arjun Makhijani and Sriram Gopal, "*Setting Cleanup Standards to Protect Future Generations: The Scientific Basis of the Subsistence Farmer Scenario and Its Application to the Estimation of Radionuclide Soil Actions Levels for Rocky Flats*" (Takoma Park, MD: Institute for Energy and Environmental Research, December, 2001). http:/ /www.ieer.org/reports/rocky/toc.html (Pu soil cleanup level)

Burrowing Animals

- Shawn Smallwood, "*Soil Bioturbation and Wind Affect Fate of Hazardous Materials that Were Released at the Rocky Flats Plant, Colorado*" (November 23, 1996), Report submitted for plaintiff's counsel in Cook v. Rockwell Int'l Corp., No. 90-CV-00181 (D. Colo.); see also the transcript of Smallwood's appearance in court in this case, pp. 3912-4130. (Burrowing animals bringing subsurface contaminants to surface)

Air/Dust Sampling

- Go to http://media.wix.com/ugd/cff93eeef7aa6815f245e18c1357249382ed97.pdf for Nichols and to http://www .rockyflatsnuclearguardianship.org/technical-resources-table-of-contents?lightbox= i23t0i for Biggs. (Inadequacy of earlier air sampling)

- Johnson et al., "*Plutonium hazard in respirable dust on the surface soil*," SCIENCE (August 6, 1976), vol. 193, pp. 488-490. Johnson et al. answered criticisms regarding dust particle size made by John A. Hayden of Rockwell in SCIENCE (June 3, 1977), vol. 196, p. 1126. (Dust sampling)

Pu Migration

- A. B. Kersting et al., *Migration of plutonium in ground water at the Nevada Test Site*, Nature, vol. 397, no. 7 (January 7, 1999). (Colloidal transport of Pu)

- Alexander P. Novikov et al., *Colloid Transport of Plutonium in the Far-Field of the Mayak Production Association, Russia*, SCIENCE, vol. 314 {October 27, 2006); notes 6 and 8 of this article reference similar long-distance plutonium

- migration at DOE's Los Alamos and Savannah River sites. (Colloidal transport of Pu)

- Kersting is quoted in David Biello, *Colloids in Russia: Have Plutonium, Will Travel*, Scientific American. Com, November 10, 2006. (Colloidal transport of Pu)

- Arnie Heller, *Plutonium Hitches a Ride on Subsurface Particles, Science & Technology Review*, Lawrence Livermore National Laboratory, October/November 201 1, pp. 16-18. (Colloidal transport of Pu)

- Win Chromec, *Report on Soil Erosion and Surface Water Sediment Transport Modeling for the Actinide Migration Evaluation at the Rocky Flats Environmental Technology Site*, 00-RF-01823/DOE-00-93258 (August 2000), p. 51 (Pu migration)

Risk

- *Health Risks from Exposure to Low Levels of Ionizing Radiation, BEIR VII* (Washington, DC: National Academies Press, 2006), p. 246. (No level of "safe" radiation exposure)

- Ulrich Beck, *Risk Society*, translated by Mark Ritter (London: Sage Publications, 1992), p. 64. (Radiation exposure)

- Tom K. Hei et al., *Mutagenic effects of a single and exact number of particles in mammalian cells*, Proceedings of the National Academy of Sciences, vol. 94 (April 1997), pp. 3765-3770. (Effects of single alpha particles)

From: "Spreng - CDPHE, Carl" <carl.spreng@state.co.us>
Date: January 4, 2017 at 10:42:53 AM MST
To: Surovchak Scott <Scott.Surovchak@lm.doe.gov>, "Moritz, Vera" <Moritz.Vera@epa.gov>
Cc: Lindsay Masters - CDPHE <lindsay.masters@state.co.us>, Kaiser Linda <Linda.Kaiser@lm.doe.gov>, "Hooten, Gwen" <Gwen.hooten@lm.doe.gov>, "David Ward" <David.Ward@lm.doe.gov>
Subject: DU Law comments

Scott and Vera,

Looks like the authors dumped everything in their arsenal into one set of comments. Part of their strategy may be to overwhelm the system. Most are easily responded to and reflect a misunderstanding of policy and guidance (Megan Davis misspoke, etc.) and of the monitoring protocols and processes. They also reflect a misunderstanding or misuse of facts. Conclusions often do not logically follow their statements or presumptions. Among the presumptions is that they speak for the "Community" or "the public". Another is that their demands "must" be met by this 5-Year Review process. And another is the relevance of past court cases on the process.

Several points they make, though, will require some attention:

1) Dust sampling - The typical surface soil samples collected the upper 6 inches, which dilutes the amount of Pu at the very surface, which is most available for resuspension. Response needs to be carefully worded.

2) Annie Kersting's research - Annie contributed to the AME and the concept of colloidal transport was well-known and considered. The quote they used was from a 2011 paper on an ongoing 5-year project. It should be easy to contact Annie about the conclusions and her opinion as to the relevance to Rocky Flats. Ultimately it doesn't matter if a minor amount of Pu is transported via colloids if all the contaminated particles end up in surface water where they are monitored.

3) Win Chromec's report on soil erosion - Need to evaluate its conclusions.

4) Need to explain some of the "unresolved failures" (e.g., the OLF) in terms of the success of the monitoring and response protocols built into the post-closure agreement.

5) Need to explain the difference between "safe" and CERCLA's "negligible risk" in the context of greater harm.

6) Misuse of the Tom Hei paper on mutagenic effects of a "single particle".

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