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Washington, D.C. 20555-001
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

March 7, 2009

Dear Mr. Kokajko:

I respectfully request that the NRC add to the docket the following new important information for technical review since it may have a major Impact to the YMP License Application under review process by the NRC:

First, recent publication by Glaviano et al, 2009 stated "Effects of hTERT on genomic instability caused by either metal or radiation or combined exposure" concluded the following: Genomic instability is considered to be an important component in carcinogenesis. It can be caused by low-dose exposure to agents, which appear to act through induction of stress-response pathways related to oxidative stress. These agents have been studied mostly in the radiation field but evidence is accumulating that chemicals, especially heavy metals such as Cr (VI), can also act in the same manner.

Previous work showed that metal ions could initiate long-term genomic instability in human primary fibroblasts and this phenomenon was regulated by telomerase. The aim of this study was to examine the difference in clonogenic survival and cytogenetic damage after exposure to Cr (VI) and radiation both singly and in combination in normal human fibroblasts (hTERT- cells) and engineered human fibroblasts, infected with a retrovirus carrying a cDNA encoding hTERT, which rendered these cells telomerase positive and replicatively immortal (hTERT+ cells). Cr (VI) induced genomic instability in hTERT- cells but not in hTERT+ cells, whereas radiation induced genomic instability in hTERT+ cells and to a lesser extent in hTERT- cells.

Combined exposure caused genomic instability in both types of cells. However, this genomic instability was more pronounced in hTERT- cells after radiation followed by Cr (VI) and more pronounced in hTERT+ cells after Cr (VI) followed by radiation. Moreover, the biological effects **provoked by combined exposure of Cr (VI) and radiation also led to a synergistic action in both types of cells**, compared to either Cr (VI) treatment only or radiation exposure only. This study suggests that telomerase can prevent genomic instability caused by Cr (VI), but not by radiation. Furthermore, genomic instability may be prevented by telomerase when cells are exposed to radiation and then Cr (VI) but not after exposure to Cr (VI) and then radiation."

I have advocated during in the **last ten year for on risk assessment of complex mixtures (metals and radiation) but regulatory agencies have failed to conduct such research** (Cr and Ni) and radiation (Pu239, and Np237). This paper provides for the first time clear data showing both additive and synergistic effects depending upon the

exposure dose. We must keep in mind that the exposure described in this paper was exposure **to** low LET energy to X-ray and gamma irritation and not high LET energy such as α particles from Pu239 and Np237.

Additionally, a major concern at Yucca Mountain is what ultimately will be the health risk to human populations in the future due to canister failure and the subsequent migration of radionuclides and heavy metals into the groundwater. A potential scenario for groundwater contamination with chemicals and radionuclides from the repository is as follows. First, a plume of heavy metals including Cr, Co, Ni and Ti will be generated from the corrosion of the spent fuel canisters and the drip shields.

These events have not been discussed in the Final Environmental Impact Statement[2] at all. The composition and the amount of various substances to be buried included 86,000 tons of alloy 22 containing 22.5% Cr, 14.5% Mo, 57.2% Ni and 0.35% V; along with 140,000 tons of stainless steel which is 17% Cr, 12% Ni, and 2.5% Mo. The health risks posed by the potential release of a fraction of this amount of heavy metals along with radionuclides must be further addressed. Recently new proposed Department of Energy canister design would double the thickness of the canister from 1" to 2" this will double the amount of heavy metals to be deposited at YMP to about 300,000 to 400,000 tons. This raises several environmentally serious concerns such as what is the carrying capacity of the zeolite, and the potential groundwater contamination by heavy metals. This must be addressed scientifically.

Also, I believe that the proposed level high nuclear waste repository at Yucca Mountain that will become a hazardous waste site due to the canisters' corrosion and the large amounts of toxic heavy metals in Alloy C-22 canisters. The State of Nevada demonstrated that Alloy C-22 can be corroded[3]. This is extremely important since YMP under current Federal law and regulations it could become a Superfund Site which will be subject to the Comprehensive Environmental Response, Compensation, and Liability Act of 1986 (CERCLA) because of substantial threat of release ... "of any pollutant or contaminate which may present in an imminent and substantial danger to public health or welfare" as defined in (42 U.S.C. § 9604)[4]. In order for the U.S. EPA to take action under CERCLA there <u>it</u> must be "a release or substantial threat of release. The discharge of a certain quantity of hazardous substances need not occur for a release or substantial threat of release to exist. Any quantities of releases, small, are adequate to trigger CERCLA." Why did the FEIS not include such discussion and information? How is the NRC going to address this issue?

References

1. Glaviano, A., Mothersill, C., Case, C.P., Rubio, M.A., Newson, R., Lyng, F. Effects of hTERT on genomic instability caused by either metal or radiation or combined exposure. Mutagenesis 24: 25-33, 2009.

2. US. Department of Energy Yucca Mountain Project, Final Environmental Impact Statement, DOE/EIS-0250 Inventory of Chemically Toxic Material, Chapter. 5, pp 5-7, February; 2002.

3. State of Nevada report C-22 Corrosion in Dipped Pore Water. www.state.nv.us/nucwaste/nwpo.htm.

4. Comprehensive Environmental Response, Compensation, and Liability Act of 1986.

Yours,

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