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RECEIVED

1995.MAR.12

Randy Brich
DOE Richland Field Office
P.O. Box 550
Richland, WA 99352

MAR 15 1995
DOE-RL / DCC

Re: CRCIA: \$Scenarios meeting: \$Scenarios ID: \$Technical Reviewers

Dear Randy,

After watching developments at Hanford from a distance for the last four years, it now seems to me the new directions Hanford science has taken are not working as well as they might, at least in regard to the Columbia River.

§1. Meeting proposal: CRCIA scenarios. There seem to be other problems, and they seem to be interconnected, and so difficult to address. This brings me to the DOE/PNL invitation of MAR.01 to meet at a time and location of my choosing to discuss overall approach and preliminary results of the scenarios for CRCIA. Alison McCulloch and I would like to meet with you and a PNL expert in Richland on one of the following dates: MAR.24 or 31 or APR.03 at a time and specific location of your choice. (If you phone with a time and place, please leave the message on the answering machine. This office will be closed the week of MAR.13.)

§2. CRCIA scenarios. My letter of FEB.28 to you, commenting on "contaminants of concern" is framed from a scenarios perspective. SEARCH strongly supports a scenarios approach coupled with semi-quantitative risk assessments to evaluate impacts and manage remediation. Therefore:

- (2.1) Please consider that letter of FEB.28 as an initial response to your Request 011423 for identification of scenarios for inclusion in CRCIA. (Copy enclosed.)
- (2.2) Please consider an additional scenario of public concern, namely, the omitted scenario. This recommendation expands upon the point made in the last paragraph of the FEB.28 letter, that something is wrong with the PNL scenarios algorithm, that it is not turning up many or most of the real problems that need to be addressed. You might think of this as the scenario of the defective scenario algorithm. I hope this question can be either resolved or more clearly defined in the proposed meeting.
- (2.3) After the proposed meeting and more information has been obtained, SEARCH will provide a follow-up identification of scenarios.

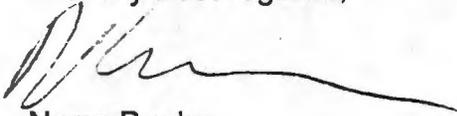
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§3. Nominees for technical review of CRCIA. I would like to look more closely at what is happening here. So I nominate myself as a technical reviewer for CRCIA for 1995, representing the general public interest. I have expertise in environmental monitoring, radiology, Columbia River ecology, hydrology, sedimentation, exposure and risk methods, state-of-the-art risk assessment, perception, uncertainty / sensitivity analysis, and pathway / scenarios assessments. I have an MA in physics and MS in oceanography and advanced course work in oceanography, usually considered equivalent to a PhD. I worked at Hanford on the Columbia River for several years regarding radiological problems, and I know a few of the Tri-Parties participants. My CV is attached. I have no conflict of interest.

I could be a reviewer either under the Tides Foundation header of this letter or under SEARCH Technical Services, as an individual resident of Washington State, whichever the Tri-Parties would prefer. I have other public interest affiliations also.

With my best regards,



Norm Buske

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NORM BUSKE

Education: University of Connecticut, Physics, MS (1965), BA (1964). Johns Hopkins University, Oceanography, PhD course studies (1968); MA (1967). USNS Eltanin (NSF) cruises, chemical and physical oceanography (1969, 1967). University of Rhode Island, special engine design studies (1973-1976). 100-hour course in accident investigation (1976).

Member: American Association for the Advancement of Science; American Geophysical Union; American Society of Mechanical Engineers; American Society for Testing and Materials; Institute of Electrical and Electronics Engineers. NAUI certified SCUBA.

Listings, Patents, Publications: American men and women of science. Two Who's Who listings. ASTM International directory of testing laboratories. US Patent Nos. 3,602,005, 3,987,767, and 4,677,950 on high-speed diesel engines and No. 5,235,150 on a microwave oven. Report on biological sampling of nuclear military base: Cadmium-109 from Puget Sound Naval Shipyard (1994). Technical Evaluation of "The safety of nuclear powered ships," prepared for the Alliance (NZ) (1993). Five review studies of Hanford Nuclear Reservation (1986-91). Reports on the French nuclear test site: Cesium-134 at Moruroa (1990) and Radioactivity in Plankton (1991). 900 accident investigation reports (1976-91).

SEARCH., Portland, OR and Davenport, WA (1978 - present)

Consulting Scientist: Physical processes in the environment: Field studies and evaluations of nuclear military operations. Sampling US and Russian naval N-facilities (1989--). Analysis of naval propulsion-reactor hazard (1993). Studies of radioactive leakage from French Nuclear Test Site at Moruroa Atoll, South Pacific; chief scientist, S.V. Rainbow Warrior (1990). Studies of radioactive pathways into Columbia River from Hanford Nuclear reservation (1985-90); studies of DoE radiological impacts at Savannah River and Padukah, KY. Study of metals pollution in alpine lake. Fire origin/cause determinations employing scenario/risk assessment methods. Specialized instrumentation.

Pacific Engineering Corp., Portland, OR (1977-1978)

Director of Research: Fire and accident investigations; flammability studies; product safety studies; computer modeling of engineering problems.

Van Gulik & Associates, Inc., Lake Oswego, OR (1976-1977)

Senior Scientist/Engineer: Redesign of flow-measuring system; design of pneumatic restraint to kiln-dry lumber; fire and accident investigations; commercial and industrial noise-level measurements; study of railroad coal car stress failures by means of gyro and accelerometer arrays.

Sea-Test Co., Laie, HI and Kingston, RI (1972-1976)

Principal: Computer simulation of hydrodynamic/population model for Millstone Nuclear Plant's impact on Long Island Sound; environmental impact studies of electric generating plants in Hawaii; circulation study of Pearl Harbor for Navy; design study for expendable sound-speed meter.

B-K Dynamics, Inc., Rockville, MD (1971-1972)

Manager, Hawaii Operation: Environmental impact and design studies for utilities.

Ocean Science & Engineering, Inc., Rockville, MD (1968-1971)

Oceanographer: Catastrophe studies at 24 sites, worldwide for Navy and industry; shallow seismic studies of Apra Harbor and Sella Bay, Guam.

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1995.FEB.28

Randy Brich
DOE Richland Operations Office
P.O. Box 550
Richland, WA 99352Re: Comments on "contaminants of concern report" PNL-10400 UC-630 DRAFT.

Dear Randy,

The draft report shows advances in methodology in the identification of Hanford contaminants of concern for the Columbia River. Its major weakness is that it still follows the old linear logic of stepping forward based on what is known rather than setting out boldly to discover what is likely far more important. ...Do you remember the mulberry jam?

I have only considered radiological impacts. The three potentially most serious radiological impacts are *not* identified in the draft report. This leaves me wondering about non-radiological impacts which might not have been identified.

The first of the three rad impacts can be explored through known extensions of conventional modeling; the second can be examined in the river; the third necessitates some innovation. Let me know if you have questions about these comments:

1. Future releases of radioactivity.

After a hundred years, governmentally planned management may be replaced by other developments. The concern here is with burials which may become mobilized by long-term changes in the hydrochemistry of Hanford's groundwater.

The starting point is to return to that old and difficult question of the fastest groundwater pathway. The reason for looking at the very fastest pathway is that the fastest pathway is necessarily an exceptional conductivity pathway. This combines a large flux with minimum sorption and minimum transit time for radioactive decay -- a dangerous combination.

At Hanford, we are very fortunate in the long tritium record for Well 699-40-1. This shows an initial spike in 1963 to 40 nCi/L, a quite well formed peak in 1966 close to 60 nCi/L, and the leading edge of the tritium plume about 1970. These three arrivals are matched with some uncertainty to tritium releases to 200E Area. Based on those historic data, I estimated the travel time to be 30 ± 10 months. Based on my flow measurement at the Old Hanford Townsite in 1986, I calculated this travel time at 3 years. Notice that the USGS review [Open-File Report 87-222] retreated from the politically sensitive issue of the shortest traveltime and only estimated an "average traveltime" of 10-20 years. The irony was that this USGS

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average traveltime was consistent with my estimate of shortest traveltime, though there was a perception that the USGS had refuted the SEARCH estimate.

This old issue is raised again now to remind you both of the deficiencies of hydro models and of the vulnerability of groundwater transport to input and output terms which will surely change grossly over the next centuries. (Traveltime would be decreased by irrigation, for example.)

My concern is that some of the burials, such as submarine reactor compartments, may not prove as stable as present conditions would extrapolate to. ***I recommend a sensitivity analysis to identify weaknesses in the linear extrapolations to identify vulnerabilities. If there are serious weaknesses -- as I believe there are -- I recommend a different approach to modeling.

2• Pu-239 in old outfall pipes.

My impression is that two or three of the old discharge pipes from the original reactor cooling systems may still be in the Columbia River bed. If so, these might almost amount to plutonium mines. If their removal and disposal is not documented, ***I recommend these old discharge pipes be included as a line item in the identified contaminants.

3• Midnight dumps of failed fuel rods.

The Corps of Engineers has resisted dredging the Hanford Reach partly because of concerns of what they might dredge up -- say, old fuel rods that were *midnight* dumped. They were so concerned about this prospect that I dived the old reactor intake areas carrying an underwater gamma detector, looking for anything obviously nasty on the bottom. That survey was sketchy and far too limited to be very reassuring. While my results were negative, I did not detect any of the Co-60 particles that were later discovered on 100-D Island.

***I recommend that the bed of the Hanford Reach be surveyed for the presence of any radioactive object that would be more hazardous than 1% of a fuel rod.

I believe these three concerns and the corresponding recommendations reflect significant risks of actual threats to human health and safety. When I compare these to the radionuclides identified as contaminants of concern in Table 9.1, I am disturbed to see that "Continued Public Concern" touches two of the three, but the formal methodology of PNL-10400 failed to turn up any of these seemingly important radiological contaminants of greatest concern for safety and health risk associated with the Columbia River. Most broadly, I believe Hanford science has yet to comprehend the basic relationships between waste disposal at Hanford and the river.

With my thanks for your consideration,
And my hopes that you are enjoying life,

Norm Buske