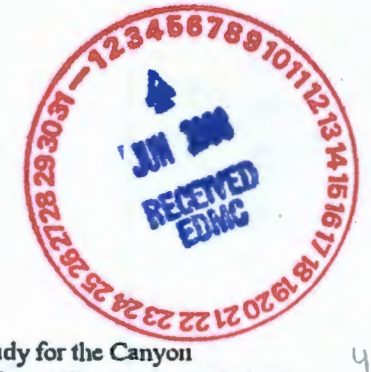
From the desk of Dirk Dunning - Private Citizen

November 18, 1997



John P. Sands
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Dear Mr. Sands:

Thank you for the opportunity to comment on the Phase I Feasibility Study for the Canyon Disposition Initiative (221-U Facility). I am writing you as a private citizen. The comments below are entirely my own. They do not represent the State of Oregon or any other organization or person.

Disposition (cleanup and dismantlement) of the canyon facilities at Hanford is a key part of cleanup. This phase I disposition initiative is intended to be the prototype for the remaining canyons. However, the hazards and problems at the U canyon are not as severe as at other canyons and analysis of U canyon should not be taken as the only input into the decisions on the rest of the canyons.

The Canyon facilities were engineered to contain the hazards presented by the dissolution of radioactive nuclear fuel. The facilities were designed to meet typical design standards for the 1940's and 1950's. Even then, they were exempted from complying with the laws that applied to construction of other structures in Washington State by the invocation of the Atomic Energy Act and National Secrecy. These facilities are not seismically sound to standards for new buildings. In many cases, standards and procedures were waived during the construction of tanks and buildings at Hanford due to limitations on time, available supplies and labor.

When the Canyon Initiative was proposed, it was envisioned as a way to dispose of high level nuclear waste within the bodies of the Canyons and low level nuclear waste packed around the outsides. This was then and is now a foolhardy proposal. It should have been rejected when it was proposed. It should be rejected now.

The proponents argue that the Canyons are "engineered structures". This is true. However, what they fail to point out is what they were "engineered" to do. They were engineered to contain the processing of nuclear fuel to separate uranium and plutonium from fission products. They were engineered to resist the buoyancy forces of the earth lifting the canyon bottom. They were NOT engineered to be filled with waste. Doing so puts enormous outward stresses on the canyon walls. They were not designed for this. Doing so puts enormous downward stresses on the canyon floor, including the bottoms of the dissolver cells. They too were not designed for this. If the canyon is buried under

twenty feet of earth and cap as has been proposed, the downward forces on the roof structures will tremendously exceed the design support strength of the canyon top. It was not designed for this. It will collapse.

The proponents responded to this criticism by proposing that holes be cut in the canyon roof and that waste be dumped into the top to fill it to the brim, then that grout be injected to fill it completely to support the roof. This is a foolish suggestion. First, if any holes are cut in the structure, or if the roof can reasonably be forecast to collapse, the canyons cannot be considered for disposal of high level nuclear waste of any kind. They will not meet the legal requirements to do so.

Second, even if the grout were injected, over time, differential settling of the waste would lead to void formation which would remove the support this grout provided for the roof. The roof would collapse under the weight of the soils above. The result in any case is a large rectangular bowl with a leaky and holed roof, a subsiding cap and a leaky bottom. Rain water would accumulate in the depression formed in the clay cap and be directed into the canyon. It would leach the radioactive and toxic components form the waste and transport these through the holes formed by the former dissolver cells were the weight of the waste in the canyon will have blown out the bottoms.

I cannot imagine a worse way to design a disposal facility. Engineers, scientists, the public and the congress will look back on everyone involved in disgust and wonder how they could have been so stupid.

Risk

In addition to these problems, the initiative proposes to leave in place many wastes and to dispose of wastes by piling them against the building. This completely disregards the requirements for liners in RCRA disposal facilities. It also disregards the requirements under RCRA, CERCLA and the AEA to protect public health and safety. Under RCRA and CERCLA, a risk assessment is required to close these facilities. In the past year, we have learned that the computer models and data used by DOE at Hanford are grossly invalid. Data on the magnitude of the source of the waste is poorly understood. Data on the location of the waste is poorly understood. Data on soil properties and transport mechanisms are nearly non-existent for Hanford's soils. Lacking these important pieces of information, it isn't possible to produce an estimate of the risk to the public and the environment, let alone assure the public that these risks are acceptable.

In addition, DOE is required to limit exposure to the public to no more than 100 millirem per year from all sources. Lacking this information, DOE cannot begin to do the calculations needed to assure compliance with this requirement.

Proposed Alternatives

The initiative offers seven alternatives for consideration and proposes limiting consideration to our alternatives. The initiative ignores the most viable alternative. Following are the eight alternatives and a discussion of the merits or problems with each. The last alternative which I have added was excluded or ignored by the proponents. It should be added and should be the preferred alternative.

No Action. - Required for CERCLA, RCRA and NEPA analysis - Not a viable option. The risks for workers, the public, and the environment are grossly unacceptable.

Full Removal and Disposal. - This is a viable option and should be considered. The costs of full dismantlement and disposal at ERDF are likely to be unacceptable. The habitat and environmental destruction at the ERDF site weigh heavily against this alternative.

Decontamination and Leave in Place. - This is a not a viable option due o the high risks to workers and the public over the long term as the structure degrades and collapses. This is a high safety risk.

Entombment with Internal Waste Disposal. - As discussed above this is a foolhardy proposal which is not viable. The Canyons were never designed to be containment structures. The floors, walls and roofs are not designed for the weight loadings which the structures would be subjected to. The result will in all probability be the failure of the canyon floors, walls and roofs over time. This will lead to failure of the surface cap and preferential inflow of water through the waste. The worst case would occur if the roof was holed or failed first, leading to water flow into the building over time, with later failure of the floor and/or walls. This could result in a catastrophic collapse of the disposal site . Internal disposal of high level waste would require that the facility be engineered to contain this waste for so long as it is dangerous. This is not within the realm of possibility for the canyons. This alternative is not viable or selectable and should be discarded outright.

Entombment with Internal/External Waste Disposal. - See Entombment with Internal Waste Disposal and additional discussions above concerning RCRA lined facilities. This alternative is not viable or selectable and should be discarded outright.

Close in Place - Standing Structure. - See discussion above. This alternative combines bad aspects of the Decontaminate and Leave in Place alternative with bad aspects o the Internal Waste Disposal alternatives. The only advantage to this is that the canyon would be clean and would not contain contaminants. The collapse of the canyon floors, walls and roofs would proceed as described above, and subsidence would lead to water infiltration through the canyon. However, since no contaminants remain to be mobilized, the only significant hazard is from the movement and disturbance on the surface. This is not a good option and probably should receive no further analysis.

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Close in Place - Collapsed Structure. - This alternative envisions using a portion of the structure for waste disposal. Continued subsidence of the structure and soils is likely though less severe than for the Internal Waste Disposal alternatives. Failure of the cap with preferential inflow of water through the waste is still a significant risk. This option should not be studied farther due to this risk.

Close in Place - Collapsed Clean Structure - No Waste Disposal. *- The initiative fails to consider this alternative. This is the single most viable alternative with the lowest risks to the environment and public health and safety. It is also likely to be the least costly of all of the alternatives when full life cycle costs are analyzed. This option should be the preferred alternative.*

Only three of these alternatives should go forward for further analysis:

1. No Action.
2. Close in Place - Collapsed Clean Structure - No Waste Disposal.
3. Full Removal and Disposal.

All of the alternatives for disposal with internal waste disposal should be dismissed outright.

The Recommendations section suggests issues to be used for selecting the alternative to use. These need to be changed as well. These issues should be used in weighing the alternatives.

1. Compliance with legal requirements in RCRA, CERCLA, AEA, other Federal laws and Washington Laws, including the Dangerous Waste regulations. (Protections for worker and public health and safety and for the environment.)
2. Compliance with Treaty Rights and obligations.
3. Complete Life Cycle Cost Analysis of each option, including a costed comparison of the value of land lost from use for its most highly valued potential purpose (Tribal or Agricultural) and the contingent valuation for lost natural resources and habitat at all affected sites, including the canyon facilities, the "borrow" or source material sites, disposal sites (ERDF area), and transport routes (where or improved routes are needed).
4. Detailed QUANTITATIVE - *not* - qualitative *validated* groundwater modeling and analysis - preceded by a detailed data acquisition effort on the vadose zone and existing wastes.
5. Analysis of availability of fill and cover materials - in full compliance with Tribal Treaty Rights and obligations. (Don't even think about using Gable Mountain or Gable Butte as sources of fill or cover materials.)
6. Analysis of residual risk from each alternative and potential impacts on requirements for cleanup at other Hanford sites to assure compliance with State and Federal laws.
7. Detailed structural analysis of the buildings for any consideration of leave in place options.
8. Overall impact on other Hanford cleanup activities.

Absolutely no consideration should be allowed for disposal of any waste from any site other than Hanford in any case.

Treaties

The U.S. government signed treaties with the Yakama Indian Nation, the Confederated Tribes of the Umatilla Indian Reservation and the Nez Perce Tribe. It is my opinion that USDOE has consistently failed to meet their trust duties to these tribes in the actions they have taken at Hanford, including their actions involving disposition of the Canyons.

Closing

The Canyon Initiative is prime example of how not to look at waste disposal. The engineers involved have described these facilities as engineered structures while completely disregarding the immense change in use they propose as a factor affecting the engineering design required. These structures are not engineered disposal facilities. It was a stupid idea when it was proposed. It remains a stupid idea today.

The canyons should be cleaned out to the greatest degree possible. The waste sites surrounding the facilities should be analyzed in detail to determine the risks they pose. Many may need to be exhumed and the waste disposed in appropriately designed and engineered disposal facilities. Upon completion of this work, the canyons should be collapsed in place and buried to minimize the disturbance of habitat at the site. In so far as waste remains at or around the basins, appropriately designed barriers should be put in place to limit the migration of these wastes - recognizing that subsidence of the structures will require long term monitoring and maintenance of the barriers. And, recognizing that man has never built a structure or barrier with a proven life as long as is needed for disposal of radioactive wastes.

A true understanding of the fate and transport of waste is needed throughout the 200 area and across the Hanford site. This requires a much better understanding of the amounts and locations of the wastes already in the ground at Hanford than exists today. 1.522 tons of plutonium is unaccounted for at Hanford. This level of uncertainty is grossly unacceptable.

Understanding the vadose zone is key to all of the decisions involving waste disposal and site closure. It is clear from comparison of DOE's projections of waste movement under the tank farms to the actual movement of these wastes that DOE has a very poor understanding of the transport of these wastes through the vadose zone. Likewise, the data for plutonium below the Z-9 crib show a similar lack of understanding of the transport of plutonium and actinides through Hanford's soils. Falsification of data for plutonium released to the environment as evidenced in Table 2T-5 of the 200 West Aggregate Area Management Study Report is equally unacceptable. (Simple data analysis of

the data presented in the table is sufficient to reveal that this data is manufactured. As a consequence, the database it came from cannot be trusted. This was reported to EPA three years ago)

A fairly precise knowledge of the amount and location of the wastes and the paths and rate of the waste movement through the soil and groundwater is a prerequisite to any analysis of the risks these wastes pose to the public or to the environment. Both CERCLA and Washington States dangerous waste regulations are risk based laws. They require that cleanup be performed to meet certain risk standards. Lacking the real validated data and validated computational models for the fate and transport of waste, these risks cannot be calculated.

The Hanford Remedial Action EIS and the Tank Waste Remediation System EIS both attempted such computations. Both relied on bad data, bad models and bad assumptions to perform their calculations. The authors expressed the opinion that they compensated for this by using conservative parameters in the models. Unfortunately, using conservative parameters in non-conservative models cannot be assured to result in conservative results. Or said more simply - garbage data applied to garbage models yields garbage results. The EIS's clearly showed how poor these analysis are and how unreliable they are by the graphic display of their results. Despite their being performed at the same time, they predict waste moving in radically different directions from the same geographic source area. This is unacceptable and must be corrected.

Finally, the Canyon Initiative is an engineering document. Washington State law requires the cognizant engineers that prepared the document to affix their engineering stamps and signatures to the document to certify that the designs of the disposal meet the requirements of law and are sound engineering designs.

Again, thank you for this opportunity to comment on the Canyon Disposal Initiative.

Sincerely,

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