

Unpublished letter from U.S. Geological Survey Scientists to the Editor of the New York Times Magazine regarding William J. Broads' November 18, 1990 article on Yucca Mountain.

By W.W. Dudley, Jr., and others

---

U.S. Geological Survey

Open-file Report 91-58



U.S. Department of the Interior

Manuel Lujan Jr., Secretary

U.S. Geological Survey

Dallas L. Peck, Director

---

For additional information  
write to:

Director, U.S. Geological Survey  
106 National Center  
Reston, Virginia 22092

Copies of this report can  
be purchased from:

U.S. Geological Survey  
Books and Report Sales  
Federal Center,  
Box 25425  
Denver, Colorado 80225



# United States Department of the Interior

GEOLOGICAL SURVEY  
BOX 25046 M.S. 425  
DENVER FEDERAL CENTER  
DENVER, COLORADO 80225



IN REPLY REFER TO:

November 28, 1990

Editor  
New York Times  
310 West 42 Street  
New York, NY 10036

Dear Sir:

We write to express our collective concern about William J. Broad's article on Yucca Mountain (New York Times Magazine, November 18, 1990). Scientists and laymen unfamiliar with details of the Yucca Mountain Project, and with the long controversy surrounding Jerry S. Szymanski's hypothesis, can only conclude from the article: (1) that Yucca Mountain is a disaster waiting to happen, (2) that the U.S. Department of Energy (USDOE) has ignored a credible and crucial issue, and (3) that earth scientists of the U.S. Geological Survey (USGS) and the National Laboratories either are incompetent or have compromised their integrity because of fear of losing their jobs. None of these conclusions are true. We believe that, if your reporter had more thoroughly examined the complex issues and available data, he would have learned the following:

I. Szymanski was hardly the first to point out that along with the concept of placing high-level radioactive wastes (HLW) "high and dry" above a deep desert water table came the responsibility to ascertain the magnitude of past water-table fluctuations. These concerns were, in fact, expressed in print by USGS scientists in 1974, 1980, 1981 and 1983. Our concerns were prompted by possible water-table fluctuations caused mainly by climate change, whereas Szymanski's concerns were driven by postulated changes due to tectonism. The USDOE's 1984 guidelines for siting HLW repositories (10CFR960), which some of us helped prepare, address the possible effects of both climate change and tectonism on ground-water systems.

II. There are -- as known to any student of earth science -- several types of calcite deposits, with or without associated opal (silica). In desert environments, most are the residue left as infiltrating moisture dries in the soil or in cracks; some were deposited from the flow of cold springs; and still others are clearly of hot spring origin, though probably not by the mechanism advocated by Szymanski. All of these types occur in southern Nevada as well as throughout the southwestern U.S., although no documented and confirmed fossil spring deposits have been identified within about 10 miles of the proposed repository site at Yucca Mountain. Moreover, the calcite-silica deposits in Trenches 8 and 14, as well as the calcite fracture fillings that are ubiquitous in the area, almost certainly have resulted from surficial processes, not from upwelling hot ground water as maintained by Szymanski. Our confidence in these conclusions comes from the convergence of evidence from topically diverse and independent studies involving USGS, Los Alamos National Laboratory, and independent experts.

III. That those who initially discounted Szymanski's findings are "now, ... not quite so sure" is a misunderstanding of the original and current positions, admittedly quite diverse, of those who reviewed Szymanski's 1987 draft. Neither Dudley nor others of the 25 scientists who contributed directly to that review have

"softened" or become unsure about their positions, and their ranks have been increased several-fold by other scientists both within and outside of the Yucca Mountain Project. In his letter transmitting the July 1989 version of his manuscript, Szymanski himself acknowledged that he had privately been given comments on his earlier draft by "over 10" State of Nevada scientists and contractors and that "it would be fair to declare that these comments expressed similar reservations as those developed by the Yucca Mountain Project participants". So far, the State has not released its own scientists' comments.

IV. Despite the assertion in the article to the contrary, the jobs of the USGS scientists (and others) working on the Yucca Mountain Project do not depend on the outcome of the site suitability studies. From the outset, the role of the USGS in the Yucca Mountain Project has been to obtain an unbiased knowledge of the geology, tectonics, hydrology, and paleoclimatology of this region. Collectively and individually, we will not be party to the endorsement of a questionable site nor the condemnation of an acceptable one.

V. The doomsday scenario provided to your reporter by Szymanski and Archambeau - namely that a water table rising to contact the waste would flash to steam, causing Yucca Mountain to blow its top -- has little credibility and, to our knowledge, is not supported by scientific analysis. Sites being proposed in other countries, and alternative sites in the U.S., require waste emplacement beneath the water table. For such sites, the USGS recommended in 1978 that consideration be given to cooling the wastes for several decades. That recommendation may be overly conservative in many geologic environments, particularly above the water table. Nonetheless, the USDOE is examining the liabilities that may offset the advantages of emplacing high-temperature waste in the unsaturated zone.

Finally, scientists working on the Yucca Mountain Project submit their draft papers for extensive review, regularly by colleagues and commonly by outside peers, as required by the USDOE and independently by the scientists' own organizations. Satisfactory resolution of the comments received must be documented and reviewed also. In contrast, Szymanski has dismissed honest criticisms of his ideas as "banality of thought", instead seeking scientific legitimacy from the press on the basis of claiming that his hypothesis has been ignored. We are well aware that, in the history of science, the outsider sometimes brings to the fore crucial new insights that were missed by the "scientific establishment". Yet, it does not follow that all new notions are ordained to be correct and that traditional science is in error. When the press fails to remember the latter, but rather manufactures a folk hero from little substance, the public is not well served. Therefore, we encourage the Times to publish an unbiased scientific sequel to the article of November 18. Until such a sequel appears, the Times will be on record as having likened Yucca Mountain to a disaster on the order of Chernobyl or even nuclear war. This is hardly unbiased journalism befitting the Times or Mr. Broad.

Sincerely,



*for* Anthony Buono; Michael D. Carr; Joe S. Downey; William W. Dudley, Jr.; Elisabeth M. Ervin; Kenneth F. Fox, Jr.; Edwin D. Gutentag; Larry R. Hayes; Blair F. Jones; Richard R. Luckey; Daniel R. Muhs; Zell E. Peterman; Marith Reheis; Richard W. Spengler; John S. Stuckless; Emily M. Taylor; John W. Whitney; William E. Wilson; Isaac J. Winograd.

U.S. Geological Survey: Denver CO, Reston VA, Las Vegas, NV, Menlo Park, CA