

July 14, 1989

NOTE TO: John Trapp  
Senior Geologist

FROM: Philip Justus  
Geology-Geophysics Section Leader

SUBJECT: PROBABILITY OF VOLCANISM AT YUCCA MOUNTAIN

This is in response to your note dated 22 June 1989 (enclosed) on the subject "Probability of Volcanism at Yucca Mountain" sent to myself and others. It is my understanding, based on our discussions on this subject, that you are satisfied your concerns are addressed in the staff's and Director's proposed comments on DOE's Site Characterization Plan (i.e., NRC's Site Characterization Analysis (SCA), discussed below).

Further, I want to point out that there are ongoing actions that should ensure prompt consideration of your concerns as they are reflected in the SCA. Also, the technical points in your note were transmitted to DOE and other parties and are due to be considered in meetings now being scheduled.

Also, as we discussed, with regard to the personal opinions that you have expressed, because you "...feel we [NRC] need to assure that the [DOE] program of investigation will concentrate on those things which can attempt to help resolve some of the technical concerns I have expressed," I consider that you have not pre-judged the site's suitability and that you properly recognize that the burden of establishing with reasonable assurance that the licensing requirements will be met falls on DOE. These are two prerequisites for the conduct of objective, impartial technical reviews by regulatory scientists. At any time you consider that your ability to remain an objective reviewer may be in question please let me know.

Specifically, the NRC actions already taken and currently underway that we discussed include:

- (1) The field trip held May 1 through 5, 1989 referenced in your note, where you and other staff observed volcanic areas currently under study by DOE and the State of Nevada.
- (2) Draft Site Characterization Analysis (SCA) has been prepared and is currently being reviewed by the Commission for transmittal to DOE.
- (3) Technical meetings with DOE to pursue, in depth, how NRC tectonics concerns can be addressed and resolved are being scheduled. In this regard, we transmitted to DOE and other parties the technical points raised in your note (letter from J. J. Linehan to R. Stein dated July 11, 1989).
- (4) Coordinated and integrated 'staff positions' on tectonics, including volcanism, for the tectonics meeting

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discussed in the Linehan to Stein letter are being developed. Your concerns will be addressed at the tectonics meetings; and

(5) Once the technical meetings have been conducted and DOE's responses to your and other staff concerns are reviewed, the open items will be tracked and evaluated on schedules warranted by their relative significance. Resolution of items will be duly documented.

(6) Interactions with the ACNW will be held at appropriate times.

Additional discussion on the above items follows. The joint NRC/DOE/State of Nevada field trip to various volcanic fields in the vicinity of YMP held in May that you and other NRC staff attended afforded an opportunity to make direct up-to-date observations of aspects of volcanism to be used to help formulate the staff's independent review capability. The trip report that you and the other participants are finalizing will express such observations.

The proposed SCA Point Papers, SCA summaries and SCA transmittal letter emphasize the need for DOE to address early in site characterization all of the potentially significant tectonic issues raised by NRC, including the ones you have raised concerning probability of volcanism.

Preparation for a tectonics meeting (or family of meetings) are underway. The draft proposed agenda for the meeting that you helped to develop, was transmitted to DOE and the State of Nevada with little modification on July 7th. Specific technical points you raised in your note and which were transmitted to DOE in the Linehan to Stein letter dated July 11th, form the basis for discussion at the proposed tectonics meeting of the SCA concern about the need for DOE to conduct early and iterative performance assessments to evaluate the impact of such potentially adverse conditions as volcanism on the waste isolation capability of the repository.

In preparation for NRC's presentation of its concerns at the forthcoming tectonics meetings, the Geology-Geophysics Section will be developing coordinated and integrated 'staff positions' on the various agenda items. The technical points that you raised in your note have merit and will be further developed to the point where they can form a 'staff position.' As you are well aware, staff positions will be subjected to our internal quality assurance (IQA) process prior to discussion at public meetings. This IQA will involve development of a technical consensus among the staff with appropriate consideration of all appropriate technical disciplines and supervisor/management concurrence and approval of the 'positions' for presentation.

I intend for you to participate in the tectonics meetings. In this manner, you will get to convey directly to your technical counterparts in DOE what your concerns are regarding probability of volcanism at YMP.

Additional opportunities to provide guidance to DOE regarding volcanism (and other tectonic matters) will arise after meetings are conducted and DOE's written responses are reviewed. DOE clearly has the responsibility of gathering data about the site sufficient to perform assessments of the suitability of the site for a repository as soon as practicable. Thus, the technical points you and others raised that bear on performance assessment, such as establishment of boundary conditions and alternative tectonic models must be addressed by DOE. You and others will have an opportunity, through the study plan review process, to focus DOE's attention on the attainment of critical information needed to resolve significant tectonics issues. Also, the Center is actively seeking consultants who are experts in aspects of volcanism (and other areas of tectonics) where necessary to assist or enhance our staff reviews of DOE's data and assessment methods, models and codes.

In summary, any attempt to bring into early focus important issues such as you have done by your preliminary analysis is in the best interest of the national program.

Enclosure:  
As stated

A handwritten signature in black ink, appearing to be 'R. Bernero', is written to the right of the 'Enclosure:' text.

cc: R. Bernero  
G. Arlotto  
R. Browning  
J. Youngblood  
R. Ballard  
J. Linehan