DEFENSE NUCLEAR FACILITIES SAFETY BOARD

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January 19, 1995

Mr. Mark Whitaker, EH-6
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, D.C. 20585

Dear Mr. Whitaker:

Enclosed for your information and distribution are 13 Defense Nuclear Facilities Safety Board staff reports. The reports have been placed in our Public Reading Room.

Sincerely,

George W. Cunningham
Technical Director

Enclosures (13)

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 19, 1994

MEMORANDUM FOR: G. W. Cunningham, Technical Director

COPIES: Board Members

FROM: A. H. Hadjian

SUBJECT: Potential Fault Issue at Rocky Flats Environmental Technology Site

1. **Purpose:** This report documents the Defense Nuclear Facilities Safety Board (DNFSB) staff meeting on July 8, 1994 in Washington, D.C. with EG&G Rocky Flats (EG&G-RF) and its consultants to review ground motion issues at the Rocky Flats Environmental Technology Site (RFETS). The purpose of the meeting was twofold:

   a. Presentation by EG&G-RF and its consultants of the seismic hazard analysis methodology and results as reported in "Seismic Hazard Analysis for Rocky Flats Plant," Draft Report, Risk Engineering, June 17, 1994.

   b. Review of investigations regarding the anomalous geological offsets recently discovered in the vicinity of Building 371, including plans for trenching.

   This report will cover only item b. above. Item a. will be reported on separately after the draft report is peer reviewed within the Department of Energy.

2. **Summary:** The DNFSB staff believes the trenching program at RFETS to investigate potential faulting close to Building 371 is progressing with inadequate planning and insufficient exploratory work. A final planning document is not yet available. Observations made to the Department of Energy-Rocky Flats (DOE-RF) office by the DNFSB staff and outside experts to enhance the preparatory work before trenching have had some impact on the process. It is expected that several exploratory pits would be dug to help better constrain the location of the trench. Nevertheless, the potential exists that the program in its present form may not resolve the fault issue at Building 371.

3. **Background:** During the shear wave tests, just prior to the conclusion of the seismic hazard study, anomalous indications were identified by EG&G-RF in the bedrock (approximately 75 million years Cretaceous-age Laramie Formation) underlying the Protected Area (PA) close to Building 371. Since the existence of potential active faults close to Building 371 could significantly impact the seismic hazard for the re-evaluation of the building, steps were taken

by EG&G-RF to investigate these anomalies. A contract was awarded to Geomatrix on July 10, 1994 for the investigation of the potential faulting.

4. **Discussion/Observations:** During the July 8, 1994 meeting, EG&G-RF indicated that available subsurface data, in addition to geophysical investigations and topographic profiling, will be used. However, the emphasis will be on trench investigations. It is EG&G's contention that the location, capability, age and potential event magnitude will be simply determined by excavating a trench northeast of the PA.

   Although the information provided during the presentation and in an earlier draft plan faxed to the DNFSB staff on April 29, 1994, are not very explicit as to the trenching program details, the Geomatrix proposal of July 5, 1994, received by the DNFSB staff on August 22, 1994, appears well thought-out. If implemented as proposed, the Geomatrix trenching program would adequately locate the trench, assess the fault capability and, if the faults are assessed to be capable, provide better constraints on the location and geometry of the faults that might project beneath or near Building 371. Geomatrix plans to review available subsurface data, conduct seismic refraction surveys, complete the field geologic mapping and topographic profiling, and drill both deep (one or more) and shallow (25 to 30) boreholes before recommending the location of the trench.

   The July 8, 1994 presentation by EG&G-RF and DOE and subsequent telephone conversations with the DNFSB staff suggest that only certain elements of the Geomatrix proposal will be implemented and, in particular, in lieu of the proposed boreholes several pits would be dug to about 25 ft. depths.

   The DNFSB staff and outside experts note the following issues with the trenching program:

   a. Information on the trenching program has been provided piecemeal. Even at this late date, the DNFSB staff has not yet been provided with anything approaching a final revised planning document.

   b. The location of the trench is not yet finalized. The DNFSB staff and outside experts strongly believe, as discussed in the Geomatrix proposal, that both refraction surveys and shallow (100 ft.) borings need to be first carried out to help in locating the potential faults and thus eliminate false trenching starts. Additionally, the ongoing mapping by EG&G-RF geologists should be completed. Schedule and cost considerations for a better planned trenching program may be driving shortcuts that EG&G-RF and DOE appear to be taking.

   d. The lessons learned from the Los Alamos National Laboratory (LANL) trenching experience are not being exploited. At LANL, an overall strategy was not developed and

the subsequent trenching program suffered as a result. Considering the alluvial deposits and hence the lack of geologic markers at RFETS, the DNFSB staff and outside experts believe that one trench without the prerequisite exploratory work, in all likelihood, would not be sufficient in locating the potential faults.

5. **Future Staff Actions:** The DNFSB staff and outside experts intend to visit RFETS after the trenching is complete some time during the Fall of 1994, to evaluate independently the EG&G-RF interpretations, based on the data collected at the trench, that would be made regarding age, slip rate and event magnitude.