



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

WASHINGTON, D.C. 20460



ENTERED

March 11, 2003

OFFICE OF
AIR AND RADIATION

Dr. Inés Triay, Manager
Carlsbad Field Office
U.S. Department of Energy
P.O. Box 3090
Carlsbad, NM 88221-3090



Dear Dr. Triay:

I am writing in response to your letter (not dated, but received by us in December 2002) that requests the Environmental Protection Agency (EPA) to accept certain changes to the previously approved Majorana Experiment located in the Waste Isolation Pilot Plant (WIPP) underground. These changes include:

- a name change,
- the addition of two counting stations,
- the occupation of more of the existing physical space in the underground, and
- an increase in liquid nitrogen consumption.

Based on the experimental descriptions in your request, we have determined that these changes represent significant departures from the existing Majorana approval. The Department of Energy (DOE) must provide more complete information to EPA in order for us to further consider these changes.

In our original approval we approved the implementation of Phase 1 and Phase 2 of the Majorana Experiment. Enclosure 1, page 1, of your submission for the original Majorana approval notes that:

Phase 1. The experimental apparatus for Phase 1 of the Majorana Project will consist of a single germanium detector operated within a modest lead shield.

Phase 2. The experimental apparatus for the second phase will consist of a single detector array containing 14 germanium detector crystals.

030318



DOE proposes a number of changes to the already approved Majorana Experiment. First, DOE proposes to change the Majorana experiment name to SEGA (Segmented Enriched Germanium Assembly) and MEGA (Multiple Element Germanium Array) to signify the changing nature of the experiments. Second, you propose the addition of several counting stations, stating that "the SEGA and MEGA experiment will have five counting stations, an increase of two from the three stations in the original Majorana configuration." The letter assigns the detectors as follows:

- SEGA – a single germanium detector inside a lead shield,
- MEGA – an array of eighteen germanium detector crystals in an annular cryostat, with zero to two individual detectors in the inner space of the annulus, similar to those used in SEGA, and
- Triangle Universities Nuclear Laboratory-Institute for Theoretical and Experimental Physics (TUNL-ITEP) apparatus – an unspecified combination of germanium and sodium iodide detectors.

Finally, the additional counting stations (detectors) will require approximately three times as much physical space and about 67 percent more liquid nitrogen daily than is currently required.

Based on our review, it appears that SEGA is analogous to Phase 1 and MEGA is approximately the same as the Phase 2 originally approved. However, note that EPA's original approval allowed the use of only two detectors, one for each Phase. DOE's statement regarding "three stations in the original Majorana configuration" suggests that the existing Majorana experiment may have been modified without EPA approval. Furthermore, based on the limited information provided in the letter, the Triangle Universities Nuclear Laboratory apparatus appears to be a new type of detector not accounted for in the initial approval. Finally, it is not clear whether the two sampling stations that will provide Los Alamos National Laboratory (LANL) an additional germanium detector arrangement to investigate background rejection techniques from cosmic muons are also new and beyond our previous Majorana Experiment Phase 1 and 2 approval.

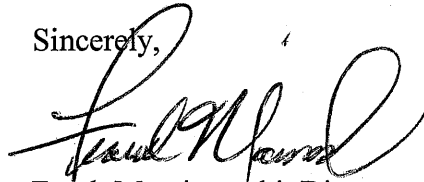
In order for us to fully evaluate the impact of these changes, and determine whether to approve them, DOE must submit more complete information which will allow a comparison to the EPA WIPP Experiment Review Checklist which has been previously provided and used by DOE in preparing such proposals. The information should clearly establish which activities are associated with SEGA, MEGA, TUNL-ITEP, and LANL; the type, number and purpose of each detector; and their relationship to Phase I and Phase II of the previous Majorana approval. DOE must also address whether the current number and configuration of detectors conforms to the existing Majorana approval.

Once again our consideration or approval of emplacement of any experiments is based solely on technical grounds in accordance with 40 CFR 194. Please be advised that any consideration or approval does not in any way constitute a determination that DOE has actual

statutory authority under the WIPP Land Withdrawal Act to conduct such activities, nor is this letter intended to indicate in any manner the Agency's opinion on this question.

If you have any questions about this guidance, please contact Betsy Forinash at (202) 564-9310.

Sincerely,

A handwritten signature in black ink, appearing to read "Frank Marcinowski". The signature is fluid and cursive, with a large initial "F" and "M".

Frank Marcinowski, Director
Radiation Protection Division

Enclosure

cc: Lynne Smith, DOE/HQ
Cindy Zvonar, DOE/CBFO
Russ Patterson, DOE/CBFO
Matthew Silva, EEG
Steve Zappe, NMED