## MILLS, LORING E., STEVENSVILLE, MD
## PAGE 1 OF 4

**Loring E. Mills**
**132 Eareckson Lane**
**Stevensville, MD 21666**
Tel: (410) 643-1244

April 25, 1996

U. S. Department of Energy
Office of Fissile Materials Disposition
P.O. Box 23786
Washington, D.C. 20026-3786

Subject: Comments on Storage and Disposition of Weapons-Usable Fissile Materials, Draft Programmatic Environmental Impact Statement (PEIS), February 1996

Gentlemen;

The Federal decision on storage and/or disposition of weapons-usable fissile materials will have an environmental impact on **Global Climate Change**. Global climate change is the primary national and international environmental concern of the 21st Century. Surprisingly, the Draft PEIS **does not effectively evaluate and compare the important items that contribute to global climate change**. The PEIS should be modified and supplemented to include a comparison of the storage and disposition alternatives as they impact global climate change.

Two primary measurable and deterministic items that are very useful measures for the contribution of any action with regard to global climate change are: **1- net energy consumption and 2- net carbon dioxide releases.** Calculations can be made, with deterministic values, for both of these items. 1/01.00.00

Attachment A: and Attachment B: of the PEIS Summary provide what is referred to as a Comparison of Environmental Impacts for each of the No-Action, Long-Term Storage and Disposition Alternatives. The twelve distinct environmental impact measures do not identify specifically the deterministic items that reveal the impact on global climate change. While the Department may believe it has included such environmental impacts within the listed measures, it is not apparent, nor does it distinctly identified the overall environmental impact related to this major environmental concern of the upcoming century. **Clearly, a distinct and specific recogaition of environmental impact on global climate change is essential to provide a complete environmental evaluation and comparison of each comprehensive alternative for such an important Federal action.**

A deterministic assessment of the important items of net energy consumption and net carbon dioxide releases, that relate directly to global climate change, is not provided with these comments. However, a brief outline and relative indication of impact is provided on page 4 as an

1

M-055

**01 00 00 Comment Number 1**

The effluents and releases from facilities described in the reasonable alternatives section in the PEIS do not include emissions that would substantially contribute to a global climate change.

attachment for reference purposes. All alternatives and process steps, other than disposition through nuclear power plant systems, are net energy consumers and will result in additional carbon dioxide releases, adversely impacting global climate change. It can be argued that the use of weapons-usable materials in all four of the reactor fuel alternatives will result in a substantial net energy production, rather than consumption, and a corresponding reduction in carbon dioxide releases. Perhaps in the cases of Existing LWRs and CANDU reactors the weapons-usable material would simply replace uranium fuel and while there is a net energy production, there would not be a decrease in carbon dioxide releases. On the other hand, since the Department's energy forecast models gradually phase out nuclear energy production when existing nuclear energy units have completed there economic life, if the Partially Completed LWRs and Evolutionary LWRs alternatives were used to consume the weapons-usable material, clearly there would be a substantial net energy production and a significant reduction in carbon dioxide releases. The Department should proceed with a detailed determination of these items and include separate environmental impact measures related to global climate change.

The Environmental Impact Tables in Attachments A and B of the Summary provide isolated impacts for individual functions and do not provide a combined set of functions that are required for specific alternatives, along with the net environmental impact of each complete alternative. As an example, to perform disposition through Vitrification, it requires Pit Disassembly/Conversion, Plutonium Conversion, Vitrification, Final Disposal and the environmental impacts of the energy production facilities supplying energy for these functions. The EIS does not combine these functions into a set of environmental impacts for a system that would be required for disposition by vitrification. Such a combined total environmental impact should be identified for each complete alternative in addition to the individual functions. Similarly, disposition through the use of Evolutionary LWR should include the combined environmental impacts of Pit Disassembly/Conversion, Plutonium Conversion, MOX fuel fabrication, Evolutionary LWR and Spent Fuel Disposition. The net combined impacts are essential to properly assess and compare the alternatives. Each complete alternative should be identified with its **combined net environmental impacts for the life cycle of the task.** 2/09.00.08

2/09.00.08 cont.

A more complete discussion is needed within the PEIS to effectively describe the weapons-usable fissile materials. High-Enriched Uranium and Plutonium are unique material in several ways. The PEIS should provide a **full listing of the physical, chemical, radiological and potential energy attributes of each material** along with a discussion on the potential impacts of each attribute. Specifically, the heavy metal characteristics and related potential toxic aspects should be discussed. A complete discussion of the radiological characteristics and potential radiological impacts along with the known means of shielding and personal protection should be included. In addition, **the equivalent potential energy content of these materials should be identified and discussed.** Since the primary means of using the potential energy values within these materials is through the production of electricity, the measure could be established as equivalent mega-watt hours, or equivalent barrels of petroleum, or tons of coal that would be required to produce the same amount of electricity that can be produced with the potential energy of these materials. These attributes and characteristics should be included in a basic discussion of the weapons-usable fissile materials within the PEIS. 3/09.09.08

2

M-055

**09 00 08 Comment Number 2**

Attachments A and B of the Draft PEIS have been deleted for the Final PEIS Summary, but still appear as tables in Section 2.5 of the Final PEIS. In response to the comments received, the Summary has also been revised to include impact analysis results for combined alternative functions.

**09 09 08 Comment Number 3**

The general discussion of the radiation mechanism and radiation human health effects are included in Section M.2. The major human health effect from radiation would be an induction of cancer fatalities, which is a common effect for any radionuclide. Therefore, inclusion of detailed discussions of each specific radioactive material is not necessary. For hazardous chemicals, since each chemical may cause different ill-health effects, complete information on the toxicity profiles of the hazardous chemicals involved in the Fissile Materials Disposition Program is described in the Section M.3.

**MILLS, LORING E., STEVENSVILLE, MD**
**PAGE 3 OF 4**

An issue of concern with regard to the alternatives of using partially completed and evolutionary LWR systems to consume the plutonium, is whether there is a need for additional electricity production capacity. Clearly, new production capacity will be required for the national system within the time period of disposition. Every year since 1975, the demand for electricity within the U.S. has increased, albet at a slower rate than prior to 1973. Also, the average age of existing electricity production facilities is increasing nearly one year for each year of time. Many of the existing facilities are becoming worn out and need to be replaced soon. Without question, new electricity production facilities are needed and will be built within the next ten years. Thus, the completion of partially completed LWRs and/or the construction of evolutionary LWRs are reasonable alternatives for the necessary additional electricity production capability. They would displace new facilities using fossil fuels and result in a significant reduction in $CO_2$ releases--affecting global climate. 4/08.03.01

Thank you for the opportunity to provide comments on the Draft PEIS for this important Federal action.

Sincerely,

Loring E. Mills

Loring E. Mills

M-055

**08 03 01** **Comment Number 4**

The Department of Energy acknowledges the commentor's support for Pu disposition in reactors. Decisions on disposition will be made based upon environmental analyses, technical and economic studies, national policy considerations, and public input.

Attachment to Comments by Loring E. Mills on the Storage and Disposition of Weapons-Usable Fissile Materials Draft Programmatic Environmental Impact Statement - Dated February 1996

**Brief Outline and Comparison Of Environmental Impact Measures For Plutonium Disposition Alternatives Affecting Global Climate Change Net Energy Consumption and Net Carbon Dioxide Releases**

| | Net Energy Consumption* | Net Carbon Dioxide Release* |
|---|---|---|
| Pit Dissembly/ Conversion | MWh and Fossil Fuels Consumed | Net $CO_2$ Release |
| Pu Conversion Fac. | MWh and Fossil Fuel Consumed | Net $CO_2$ Release |
| Direct Disposition | MWh and Fossil Fuel Consumed | Net $CO_2$ Release |
| Ceramic Immobilization/ Borehole | MWh and Fossil Fuel Consumed | Net $CO_2$ Release |
| Borehole Complex | MWh and Fossil Fuel Consumed | Net $CO_2$ Release |
| Vitrification | MWh and Fossil Fuel Consumed | Net $CO_2$ Release |
| Ceramic Immobilization | MWh and Fossil Fuel Consumed | Net $CO_2$ Release |
| Electrometallurgical Treat | MWh and Fossil Fuel Consumed | Net $CO_2$ Release |
| MOX Fuel Fabrication | MWh and Fossil Fuel Consumed | Net $CO_2$ Release |
| Existing LWR | MWh Produced & Fossil Fuel Consumed | No Change (replaces U fuel) |
| Partial Completed LWR | MWh Produced & Fossil Fuel Consumed | Significant Reduction in Net $CO_2$ Release |
| Evolutionary LWR | MWh Produced & Fossil Fuel Consumed | Significant Reduction in Net $CO_2$ Release |
| CANDU Reactor | MWh Produced & Fossil; Fuel Consumed | No Change (replaces U fuel) |

* Values should include the construction of facilities and the total life cycle amount involved with the consumption of all surplus weapons-usable materials



M-055