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December 16, 2004

Division of Waste Management and Environmental Protection
Office of Nuclear Material Safety and Safeguards
U. S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Re: NUREG-1790, DEIS for Proposed National Enrichment Facility, Lea County, New Mexico

Dear Sirs:

Enclosed, please find the Western Governors' Association comments on the Draft Environmental Impact Statement for the Proposed National Enrichment Facility, to be located in Lea County, New Mexico.

Should you have questions, please contact Mr. Bill Mackie of my staff.

Sincerely,

Pam O. Inmann

Pam O. Inmann
Executive Director

enclosure:

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E-RIDS = ADM-03
Add = A. Brodford (AHB1)
T. Johnson (TCJ)

SISP Review Complete
Template = ADM-013

**Western Governors' Association**
**Comments on the Draft Environmental Impact Statement (DEIS)**
**for the Proposed National Enrichment Facility**
**in Lea County, New Mexico (NUREG 1790)**
**Prepared by the Staff of the US Nuclear Regulatory Commission**
**September 2004**

**General Comment:**

On November 30, the Western Governors' Association (WGA) and the States of Colorado and Wyoming met with officials from the National Enrichment Facility (NEF) to discuss the proposed National Enrichment Facility in Lea County, NM. In addition to discussions on their draft Environmental Impact Statement, NEF agreed to stakeholder involvement in the development of a comprehensive Transportation System.

**Comments:**

**Item 1:**

"The proposed NEF would be licensed in accordance with the provisions of the *Atomic Energy Act*. Specifically, an NRC license under Title 10, "Energy," *U.S. Code of Federal Regulations* (10 CFR) Parts 30, 40, and 70 would be required to authorize LES to possess and use special nuclear material, source material, and byproducts material at the proposed NEF site." DEIS page iii

Comment 1 (a)
The final Environmental Impact Statement (EIS) should specify what organization will own the special nuclear material, source material and byproduct material, therefore specifying the responsible party for each of these materials.

Comment 1 (b)
The final EIS should specify what organization will own the NEF, therefore specifying the responsible party.

**Item 2:**

"Nuclear power plants are currently supplying approximately 20 percent of the Nation's electricity requirements, but only about 15 and 14 percent of the enrichment services that were purchased by U.S. nuclear reactors in 2002 and 2003, respectively, were provided by enrichment plants located in the United States." DEIS page xix

Comment 2 (a)
The question is not the fraction of enrichment services provided by USEC in 2002 and 2003, but rather what fraction of fuel will be met in the future based upon the use of MOX, the disposition of the 60,000+ kilograms of weapons Pu, any additional enriched U from Russia, increased burnup of fuel at the power reactors, relative costs of domestic and foreign provided SWOs, cost of uranium, etc. Accordingly, the final EIS should evaluate plausible scenarios relating to these important economic variables.

Comment 2 (b)
". . . but only about 15 and 14 percent of the enrichment services that were purchased by U.S. nuclear reactors in 2002 and 2003, respectively, were provided by enrichment plants located in the United States." Was this because of cost considerations, because of enrichment services shortfall, or because the electric utilities desired a diversity of supply? Generally, utilities purchase fuel at the lowest cost, not necessarily based upon country or origin (as in uranium ore from Canada or Australia rather than uranium ore from the United States). The final EIS should clarify the reason for the specified percentages.

Comment 2 (c)
The final EIS should specify what fraction of U to $UF_6$ conversions services were provided by domestic (US) facilities as opposed to foreign facilities. The final EIS should specify what fraction of oil consumed in the US is refined in facilities located in the United States. These two ratios would be more relevant comparisons than ones already provided.

**Item 3:**

"Use of a U.S. Department of Energy (DOE) conversion facility in Paducah, Kentucky, or near Portsmouth, Ohio, for disposition of depleted uranium hexafluoride ($DFU_6$) could extend the operating life of the conversion facility, and therefore, the socioeconomic impacts associated with the operation." DEIS page xxii

Comment 3 (a)
As a result of DOE and predecessor organization operations there exists a huge backlog of $DUF_6$. The final EIS should provide support to the implied assertion that the DOE conversion will be available for use for the $DUF_6$ waste produced by the NEF.

Comment 3 (b)
What is the estimated cost for disposal, assuming the NEF $DUF_6$ is converted? The final EIS should provide a basis (letter from suppliers of services, quotations, contracts, agreements in principle, etc.) of the disposal cost. What organization will own the $DUF_6$ that is planned to be stored at the NEF? What organization will own the cylinders that will contain the $DUF_6$ stored at the NEF? The final EIS

should address these questions and therefore specify the responsible parties for the $DUF_6$ and the cylinders.

**Item 4:**

"Construction of a new privately owned conversion facility, whether adjacent to the proposed NEF or potentially near Metropolis, Illinois, would have comparable impacts to the DOE conversion facilities." DEIS page xxiv

Comment 4

The final EIS should provide support to the implied assertion that $DUF_6$ waste would be processed at a facility adjacent to the NEF or one near Metropolis, Illinois. It should specify plans for these facilities and it should explain why there would be comparable impacts to the DOE conversion facilities. The paragraph below starts with the statement that: "No private company has yet agreed to construct or operate a $DUF_6$ to $U_3O_8$ conversion facility anywhere in the United States."

"No private company has yet agreed to construct or operate a $DUF_6$ to $U_3O_8$ conversion facility anywhere in the United States. LES suggested the construction of a $DUF_6$ to $U_3O_8$ conversion facility near Metropolis, Illinois. The existing ConverDyn plant at Metropolis, Illinois, converts natural uranium dioxide ($UO_2$) (yellow cake) from mining and milling operations into $UF_4$ and $UF_6$ for feed to enrichment facilities such as the proposed NEF (ConverDyn, 2004). Construction of a private $DUF_6$ to $U_3O_8$ conversion near the ConverDyn plant in Metropolis, Illinois would allow the hydrogen fluoride produced during the $DUF_6$ to $U3O_8$ conversion process to be reused to generate more $UF_6$ feed material while the $U_3O_8$ would be shipped for final dispositioning." DEIS page 2-29

**Item 5:**

"Costs associated with construction activities would be approximately $1.2 billion (2002 dollars) excluding escalation, contingencies, and interest." DEIS page xxiv

Comment 5

The final EIS should provide a complete estimate, including contingencies and interest.

**Item 6:**

"For the no-action alternative, the proposed NEF would not be constructed, operated, and decommissioned in Lea County, New Mexico. The Paducah Gaseous Diffusion Plant in Paducah, Kentucky, and the down-blending of highly enriched uranium covered under the "Megatons to Megawatts" program (both are managed by USEC) would remain the sole source of domestically generated low-enriched uranium for U.S. commercial nuclear power plants. Foreign enrichment sources would continue supplying more than 85 percent of the U.S. nuclear power plants demand until other new domestic suppliers are constructed and operated. In the long term, this could lead to increase reliance on foreign suppliers for enrichment services." DEIS page xxiv

Comment 6

Currently over 30 reactors in Europe (Belgium, Switzerland, Germany and France) are using MOX and a further 20 have been licensed to do so. Japan also plans to use MOX in around a third of its reactors by 2010. Most reactors use it as about one third of their core, but some will accept up to 50% MOX assemblies. France aims to have all its 900 MWe series of reactors funning with at least one third MOX.

Russia and the United States have held extensive discussions on plutonium disposition, culminating in a September 2000 agreement to dispose of 34 metric tons of surplus weapons-grade plutonium in each country. That is 68 tonnes (68,000 kilograms)! And that is not all the weapons grade Pu available in the US and Russia. *(Please see NUREG/BR-0284, Mixed Oxide Exchange, published by the U.S. Regulatory Commission relating to the licensing of a mixed oxide (MOX) nuclear fuel fabrication facility.)*

In view of the plans by the US NRC to license an MOX fabrication plant, the associated plans by the DOE to dispose of 68,000 kilograms of weapons grade plutonium, plans of others to fabricate MOX for use by US light water power reactors, and the potential increase in enriching services (from Brazil, Communist China, and others), the final EIS should address the actual need for the NEF. This is particularly important because if the NEF is constructed but is uneconomical to operate (its capital costs should be greater than $1.8 billion including interest, escalation and contingencies), the operators could assert commercial impracticability (declare bankruptcy) and the facility would revert to the owners of the facility in a diminished, yet highly competitive, market for enriched uranium.

The final EIS should provide information on the source of supply of the uranium used in US power reactors and what fraction is provided by foreign sources.

**Item 7:**

"Non-radioactive gaseous effluents include argon, helium, nitrogen, hydrogen fluoride, and methylene chloride (LES, 2004a)." DEIS page 2-23

Comment 7

The final EIS should indicate the source(s) of the hydrogen fluoride.

**Item 8:**

"The Programmatic EIS evaluated the potential environmental impacts of disposal in shallow earthen structures, below-grade vaults and underground mines." DEIS page 2-42

Comment 8 (a)
The final EIS should specifically clarify that costs are the reason that placement in underground mines was not considered viable and not discussed further. NRC acknowledges that LES proposed several disposal options for $DUF_6$, including placement of depleted $U_3O_8$ in underground mines (specifically, LES proposed using exhausted Ur mines owned by Cotter in Colorado), shallow earthen structures, below-grade vaults, and several international treatment options. The text, however, is unclear in attaching the non-viability to the international options or to the underground options or to all options listed in this paragraph.

Comment 8 (b)
If costs were the reason why placement of $DUF_6/U_3O_8$ in underground mines was not considered, the final EIS should provide additional information on why the costs are considered to be so high for such a low technology alternative as well as the additional factors that may have contributed to NRC's rejection of that alternative.

Comment 8 (c)
NRC's statements throughout the DEIS that all radioactive wastes from the LES facility go to appropriate licensed facilities is strongly supported. Currently, there are no such licensed disposal facilities (in the State of Colorado, for example) and the states have no knowledge of any entity proposing disposal in old mines. Additionally, disposal in mines seems to be inconsistent with DOE's preferred alternative in the Depleted Uranium PEIS of 1999 (DOE/EIS-0269, April 1999).

**Item 9:**

The information at the bottom of page 2-55 is incomplete. It reads as follows:

"SMALL to MODERATE during accidents. If a rail accident involving the shipment of $DUF_6$ occurs in an urban area, approximately 28,000 people could suffer" . . . ????

Comment 9
The final EIS should include the missing information.

**Item 10:**

The information at the bottom of 2-56 is incomplete. It reads as follows:

"SMALL to MODERATE for accidents. Although highly unlikely, the most severe accident is estimated to be the release of $UF_6$ caused by rupturing an over-filled and/or over-heated cylinder, which could incur a collective" . . . ????

Comment 10
The final EIS should include the missing information.

**Item 11:**

Table 3-21, Current Traffic Volume for the Road systems in the Vicinity of the Proposed NEF Site (page 3-67) lists traffic volume per day. Average volume per day includes evening and nighttime traffic (which is very low) as well as traffic on Saturdays and Sundays. A more meaningful measure is average volume per hour for the peak load traffic period (6 AM to 6 PM, Monday through Friday). With this measure the reported traffic volume would not be diluted by off-hours and low weekend traffic.

Comment 11
The final EIS should show the more meaningful measure, which would reflect, not an average traffic volume, but traffic volume during the time construction related traffic and school busses are on the road.

**Item 12:**

"The surrounding air quality would be affected by non-radioactive gaseous effluent releases during operation of the proposed NEF. Non-radioactive gaseous effluents include hydrogen fluoride and acetone. The proposed NEF would release approximately 1 kilogram (2.2 pounds) per year of hydrogen fluoride, 40 liters (11 gallons) of ethanol, and 610 liters (161 gallons) of methylene chloride per year (LES, 2004a)." DEIS page 4-8

Comment 12
The final EIS should indicate the sources of hydrogen fluoride.

**Item 13:**

"The highest employment would occur in the second through fifth construction years with employment peaking at 800 jobs in the fourth year (LES,, 2004a)." DEIS page 4-19

Comment 13
The final EIS should provide an analysis that shows the local roads can handle the increased vehicle (construction workers, deliveries to the site) traffic during normal work hours (that is, 6 AM to 6 PM, Monday through Friday) in the fourth year.

Item 14:

Page 4-34 of the DEIS presents many "candidate" solutions to the disposal of the $DUF_6$ waste materials.

"The impact of transporting the depleted uranium to a conversion facility were also analyzed. Conversion could be performed either at a DOE or a private conversion facility. Currently DOE conversion facilities are being constructed at Paducah, Kentucky, and Portsmouth, Ohio. For the purpose of this analysis, it is assumed that the private conversion facility will be located at Metropolis, Illinois. As discussed previously in Section 2.1.9 of Chapter 2 of this Draft EIS, LES suggested the construction of a $DUF_6$ to $U_3O_8$ conversion facility near Metropolis, Illinois. The existing ConverDyn plant at Metropolis, Illinois, converts natural uranium dioxide ($UO_2$) (yellow cake) from mining and milling operations into $UF_4$ and $UF_6$ for feed to enrichment facilities such as the proposed NEF (ConverDyn, 2004). Construction of a private $DUF_6$ to $U_3O_8$ conversion facility near the ConverDyn plant in Metropolis, Illinois, would allow the hydrogen fluoride produced during the $DUF_6$ to $U_3O_8$ conversion process to be reused to generate more $UF_6$ feed material while the $U_3O_8$ would be shipped for final disposition. The NRC staff has determined that construction of a private $DUF_6$ to $U_3O_8$ conversion plant near Metropolis, Illinois, would have similar environmental impacts as construction of an equivalent facility anywhere in the United States. The advantage of selecting the Metropolis, Illinois, location is the proximity of the ConverDyn $UO_2$ to $UF_6$ conversion facility and, for the purposes of assessing impacts, the DOE conversion facility in nearby Paducah, Kentucky, for converting DOE-owned $DUF_6$ to $U_3O_8$. Because the proposed private plant would be similar in size and the effective area would be the same as the Paducah conversion plant, the environmental impacts would be similar.

The $DUF_6$ would be placed in Type 48Y cylinders for either temporary onsite storage or shipment offsite. If the $DUF_6$ were shipped offsite, 627 truck shipments with 1 cylinder per truck would be transported to a conversion facility located near Paducah, Kentucky; Portsmouth, Ohio; or Metropolis, Illinois. At the conversion facility, the $DUF_6$ would be converted into $U_3O_8$. After conversion, the $U_3O_8$ could be shipped from Paducah, Kentucky and Portsmouth, Ohio to Envirocare near Clive, Utah, or, if converted at a DOE facility, the Nevada Test Site for disposal. The $U_3O_8$ from Metropolis, Illinois could be shipped to Envirocare. If the $DUF_6$ were converted to the more chemically stable form of $U_3O_8$ at an adjacent conversion facility to the proposed NEF, the conversion product of $U_3O_8$ and calcium fluoride ($CaF_2$) could be shipped to Envirocare or U.S. Ecology in Hanford, Washington. The hydrofluoric acid generated during the process of converting the $DUF_6$ to $U_3O_8$ could be reused in the process of generating $UF_6$ or neutralized to $CaF_2$ for potential disposal at the same site as the $U_3O_8$. The conversion process would generate over 6,200 metric tons (6,800 tons) of $U_3O_8$ and 5,200 metric tons (5,700 tons) of $CaF_2$ annually. Assuming that this material would be shipped in 11.3 metric ton (25,000 pound) capacity bulk bags, 547 and 461 bulk bags would be required annually to ship the $U_3O_8$ and $CaF_2$, respectively, with one bulk bag per truck."

Comment 14
In order to determine the commercial practicality of the scenario, the final EIS should include a cost estimate for each element of the above scenario as well as the basis of the cost estimate (engineering study, information from a vendor, published report (other than that from the Applicant). For the facilities that are already in existence, like Envirocare, a letter from the firm indicating that it can accept the material ($U_3O_8$ as well as very large quantities of $CaF_2$) at a cost or range of costs for service would be acceptable documentation.

**Item 15:**

Beginning on page 4-39 of the DEIS, the Chemical Impacts From Transportation Accidents are summarized. The assumptions supporting the impacts presented in Table 4-7 are provided in Appendix D, Section D.5. Page D-26 presents some of the assumptions used in the accident analysis. The "maximally exposed individual" is not defined in the DEIS, but generally is considered an adult male.

"DOE evaluated chemical impacts to rural (6 persons per square kilometer [15 persons per square mile]), suburban (719 persone per square kilometer [1,798 persons per square mile]), and urban (1,600 persons per square kilometer [4,000 persons per square mile]) areas." DEIS page D-26

Comment 15
If the 'maximally exposed individual" used in the analysis is an adult male, then the consequences of the analyzed accidents (that is "potential health effects" and "irreversible adverse health effects") should reflect the fact that a representative population includes females, the embryo-fetus, children, infants, the elderly and the inform. Moreover, occupational exposure levels must not be used as a guideline for exposure of the public to HF. Many segments of the public do not have the characteristics of "Reference Man". The final EIS should specifically define the "maximally exposed individual".

**Item 16**:

With regard to transportation accidents involving $UF_6$ and fire (page D-26, Section D.5), First Responders may not be currently versed in necessary safety precautions. The transportation of $UF_6$ is not a routine occurrence along some of the proposed routes. It appears that an inherent assumption in the accident scenarios is that First Responders provide prompt and effective countermeasures that minimize the effects of the accident.

Comment 16
The final EIS should evaluate transportation scenarios that include a range of countermeasures and various times after the accident at which the

countermeasures are initiated. Moreover, the final EIS should require the Applicant to provide periodic (annual) training to First Responders along the routes.

Item 17:

"Facility Worker Uranium Intake and Exposure to Hydrogen Fluoride

The accident consequences to a facility worker include the risks of toxicological effects of uranium intake, radiation dose from uranium intake, and exposure to hydrogen fluoride concentration in air. The amount of uranium a facility worker could inhale (uranium intake) is calculated by assuming the worker is exposed to C1(t) until T1 = 5 minutes after the start of the release (LES, 2004a). By T1 = 5 minutes, a worker is assumed to successfully escape the affected room. The uranium intake is calculated by assuming the worker inhales at a constant breathing rate of $3.33 \times 10^{-4}$ cubic meters per second (20 liters per minute, **which is consistent with the breathing rate used by NRC in 10 CFR Part 20, Appendix B, for Reference Man performing "light work."** Similarly, the hydrogen fluoride concentration to which a facility worker could be exposed is calculated by evaluating the time-averaged hydrogen fluoride concentration during the first T1 = 5 minutes.

"For the uranium intake and hydrogen fluoride exposure calculations, it is assumed that sufficient moisture (i.e., humidity) is present in the room to completely convert released $UF_6$ gas to $UO_2F_2$ particulate matter and hydrogen fluoride vapor. This assumption results in a conservative estimate of the concentration of hydrogen fluoride vapor that would be present in both the affected room of the proposed NEF and downwind." DEIS page C-18

A key assumption is that: "The uranium intake is calculated by assuming the worker inhales at a constant breathing rate . . . used by NRC in 10 CFR Part 20, Appendix B, for Reference Man performing "light work." Similarly, the hydrogen fluoride concentration to which a facility worker could be exposed is calculated by evaluating the time-averaged hydrogen fluoride concentration during the first T1 = 5 minutes."

Comment 17
In an accident situation, it is unreasonable to assume that the breathing rate of a male worker involved in the accident is identical as the breathing rate of a worker (Reference Man) performing "light work". In an accident situation, blood pressure increases, heart rate increases, blood stream adrenaline values increase (Adrenaline causes quickening of the heart beat, strengthens the force of the heart's contraction, opens up the bronchioles in the lungs and has numerous other effects. The secretion of adrenaline by the adrenal is part of the "fight-or-flight" reaction that we have in response to being frightened,) and breathing rate increases.

Table 5A-6 (from EPA/600/P-95/002Fa, August 1997, VOLUME I – GENERAL FACTORS EXPOSURE FACTORS HANDBOOK) provides a summary of reasonable assumptions regarding breathing rates for various activities. Based upon the EPA (and clearly a more reasonable assessment of what transpires to the breathing rate during an accident situation) a greater breathing rate must be used in order for the analysis to somewhat reflect reality. Accordingly, the final EIS Appendix C should show new calculations using a breathing rate representative of the breathing rate for a worker involved in an accident not a worker performing routing tasks in "light activity".

**Item 18:**

"The cost for decontamination and decommissioning of the proposed NEF would be approximately $837.5 million in 2002 dollars. The majority of this cost estimate ($731 million) is the fee for disposal of the $DUF_6$ generated during operation assuming the $DUF_6$ would be not be disposed of prior to decommissioning." DEIS page 4-63

Comment 18 (a)
It is unclear if the Applicant plans to own the $DUF_6$ or the customer of the facility will own the $DUF_6$. If the Applicant owns the $DUF_6$, then at what time does the ownership transfer from the customer to the Applicant? The final EIS should clarify ownership of all $UF_6$ and $DUF_6$ during various stages.

Comment 18 (b)
If, for whatever reason or combination of reasons (use of MOX, longer burnup of fuel at reactors, foreign competitors reduce price of SWU, the cost of U increases thus making MOX more attractive, regulatory requirements for additional safety equipment are put in place, etc.), it is commercially impractical to continue providing enriching services (after 5 years, after 10 years, after 15 years of operations), will there be sufficient funds to dispose of the $DUF_6$ and will the facilities and firms that are discussed in the DEIS as thoughts for treatment and disposal of $DUF_6$ be in existence at those times? The final EIS should discuss these contingencies.