October 11, 2005

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of	)	
	)	
LOUISIANA ENERGY SERVICES, L.P.	)	Docket No. 70-3103
	)	
(National Enrichment Facility)	)	ASLBP No. 04-826-01-ML

NRC STAFF REBUTTAL TESTIMONY REGARDING DISPOSAL

Q.1. Please state your name, occupation and by whom you are employed.

A.1. (TJ) Timothy C. Johnson. I am the U.S. Nuclear Regulatory Commission (NRC) Project Manager overseeing the licensing of the proposed Louisiana Energy Services, L.P. (LES) uranium enrichment facility near Eunice, New Mexico. I have been the PM for the project since its inception in January 2002, when LES initiated discussion with NRC for the project.

A.1. (JM) Jennifer Mayer. I am employed as a consultant by ICF Consulting. I am providing this testimony under a technical assistance contract with the NRC.

A.1. (CD) Craig Dean. I am employed as a consultant by ICF Consulting. I am providing this testimony under a technical assistance contract with the NRC.

A.1. (JP) James Park. I am the NRC Project Manager for the environmental review of the application for construction and operation of the proposed uranium enrichment facility submitted by LES.

A.1. (DP) Donald E. Palmrose, Ph.D. I am employed by Advanced Systems Technology and Management Incorporated. I am providing this testimony under a technical assistance contract with the NRC.

Q.2. Have you previously submitted testimony in this proceeding?

A.2. (TJ, JP, DP) Yes, we provided pre-filed direct testimony in this proceeding on September 15, 2005, on behalf of the NRC Staff. In that testimony, we described our individual responsibilities related to the NRC Staff's review of the application by Louisiana Energy Services, L.P. (LES) to construct and operate a uranium enrichment facility in Lea County, New Mexico, to known as the National Enrichment Facility (NEF). Statements of our professional qualifications were attached to that testimony.

Q.3. What was the purpose of your previous testimony?

A.3. (TJ, JM, CD, JP, DP) The purpose of our joint direct testimony was to provide the NRC Staff's views concerning the admitted contentions regarding the plausibility of LES's proposal to dispose of the triuranium oxide (U_3O_8) produced by the deconversion process.

Q.4. What is the purpose of this testimony?

A.4. (TJ, JM, CD, JP, DP) To provide our views on NIRS/PC's pre-filed testimony of Dr. Arjun Makhijani regarding disposal.

Q.5. Have you read the direct pre-filed testimony of Dr. Makhijani regarding the need for disposal of depleted uranium? If so, what is your opinion of Dr. Makhijani's testimony that no strategy for disposal of depleted uranium can be considered plausible without presentation of a site specific analysis demonstrated compliance with the performance objectives in 10 C.F.R. Part 61 and other environmental regulations?

A.5. (TJ, JP, DP) Yes we have. We disagree with Dr. Makhijani's conclusion on this subject. While disposal of the depleted uranium waste generated by the proposed enrichment facility can only be accomplished at a site which is licensed to accept the waste, the licensing of the waste disposal site is not part of, or necessary to, the Staff's evaluation or decision on the application for a license to construct and operate the proposed

enrichment facility. Whether disposal can be accomplished at any specific disposal site is a matter considered in the issuance of the license for that site, not this licensing action. Thus, we disagree with Dr. Makhijani's claim that a site-specific analysis of potential disposal sites must be considered as part of this licensing action. While Dr. Makhijani cites a footnote in the Department of Energy's Final Environmental Impact Statements for construction and operation of depleted uranium conversion facilities at Portsmouth, Ohio and Paducah, Kentucky, to support this position, a more thorough reading of these documents makes clear that DOE is deferring to the site specific evaluations performed for the licensing of the low level waste disposal facility. As DOE states:

> This EIS evaluates the impacts from packaging, handling, and transporting conversion products from the conversion facilities to a LLW disposal facility. The disposal facility would be (1) selected in a manner consistent with DOE policies and orders and (2) authorized or licensed to receive the conversion products by either DOE (in conformance with DOE orders), the NRC (in conformance with NRC regulations), or an NRC Agreement State agency (in conformance with state laws and regulations determined to be equivalent to NRC regulations). Assessment of the impacts and risks from on-site handling and disposal at the LLW disposal facility is deferred to the disposal site's site-specific NEPA or licensing documents.

LES Exhibit 16 at 2-27; LES Exhibit 17 at 2-25 (emphasis added).

Q.6. What is your opinion of Dr. Makhijani's testimony regarding the need for disposal of depleted uranium in a deep geological repository?

A.6. (TJ, JP, DP) Dr. Makhijani, in his pre-filed testimony, argues that the U_3O_8 produced by the deconversion process will likely require disposal in a deep geologic repository. Although he recognizes that this depleted uranium, in the form of U_3O_8, is not transuranic waste, Dr. Makhijani implies that it must nevertheless be subject to the same regulatory requirements because of certain comparable radiological properties,

concluding further that transuranic waste is "similar to the classification of Greater than Class C (GTCC) waste" under 10 C.F.R. § 61.55(a), presumably to demonstrate that depleted uranium must also be classified GTCC. He then states that because shallow land disposal is generally not appropriate for transuranic or GTCC waste, it would not be appropriate for the depleted uranium.

Dr. Makhijani is not correct that depleted uranium must be classified in the same manner as transuranic waste. While he points out that uranium has a long half life and is an alpha emitter like many transuranic wastes, the waste classification limits established by NRC regulations take into account numerous characteristics relating to disposal, including waste form, radioisotope characteristics, disposal site characteristics, radioisotope concentrations and the method of emplacement. NIRS/PC Exhibit 109 at S-21. Given these variables, one would expect that different types of waste would be subject to different waste controls depending on their specific characteristics.

This is exactly the case under the waste classification established by the Commission's regulations. As explained in our pre-filed direct testimony, uranium is by definition Class A waste under 10 C.F.R. § 61.55(a)(6) because it is not a radionuclide listed in the tables provided in the regulation. LES Exhibit 101. As explained in the Final Environmental Impact Statement for the regulation, the omission of uranium from those tables was based on a determination by the Commission that the types of uranium-bearing wastes being typically disposed of by NRC licensees did not present a sufficient hazard to warrant any limitation on the concentration of this naturally occurring material and did not typically contain daughter products in any quantity because of the relatively short time since the uranium was refined from ore. NIRS/PC Exhibit 169 at 5-38. In contrast, alpha emitting transuranic nuclides are listed in Table 1 and are subject to a concentration limit. LES Exhibit 101.

Thus, under the Commission's waste classification scheme, uranium is considered Class A waste, not GTCC. Dr. Makhijani's arguments on this point are, in essence, a challenge to this regulatory scheme and are therefore not addressed further in our testimony. As Class A waste, under the Commission's regulations depleted uranium may be disposed of in a shallow land disposal facility provided that the performance objectives of Part 61 for the specific disposal site are satisfied. Dr. Makhijani has provided no basis for concluding that these performance requirements cannot be met at any potential site available to LES for the disposal of depleted uranium and that this option is therefore not plausible. While he has presented a Table attempting to demonstrate that ingestion of uranium in drinking water is as dangerous as plutonium, this analysis is of no consequence if ingestion in this manner will not occur. As he has pointed out at page 15 of his testimony, "calculated doses from the disposal of uranium are strongly dependent upon the geology of the site, the soil chemistry, the site meteorology, the assumed exposure scenarios, and many other site specific factors." Because of its particular site specific characteristics, the Envirocare disposal facility, licensed by the State of Utah, is authorized to accept depleted uranium in unlimited quantities for shallow land disposal. LES Exhibit 104, Staff Exhibit 44.

Q.7. How was it determined whether Envirocare can accept depleted uranium for shallow land disposal?

A.7. (TJ, JP, DP) Envirocare has been issued a license to accept waste containing uranium by the State of Utah. The issuance of this license was necessarily premised upon a site specific analysis of the potential health effects of shallow land disposal of uranium at the Envirocare site and compliance with the State's performance requirements which are essentially equivalent to those of 10 C.F.R. Part 61, Subpart C. Staff Exhibit 45 at 3-2. Among other things, these performance objectives provide that radioactive releases in

ground and surface water, air, soil, plants or animals must not exceed certain limits. *See,* 10 C.F.R. § 61.41. LES Exhibit 101. Factors which the State considered in its evaluation included the unsuitability of the site for residential or farming use due to site conditions such as low precipitation, high evapotranspiration, the lack of suitable irrigation and high salinity of the soil and ground water. LES Exhibit 104. Because of these site-specific factors, the possibility that uranium could be ingested through residential, agricultural or intruder pathways was not considered to be realistic. LES Exhibit 104, Staff Exhibit 45 at ES-4. Therefore, the premise for Dr. Makhijani's dose assessment - which assumes ingestion of uranium and other radionuclides in drinking water - would not be applicable for this particular site. The State regulatory authority has stated that Envirocare is authorized to accept depleted uranium in unlimited quantities. LES Exhibit 104, Staff Exhibit 44.

Q.8. Based on the foregoing, what is your opinion of Dr. Makhijani's claim that the cost of deep geological disposal rather than shallow land disposal should be included in the LES cost estimate?

A.8. (TJ, JM, CD, JP, DP) We believe that because depleted uranium is Class A waste and that shallow land disposal is feasible for the waste generated by the proposed enrichment facility; specifically at the Envirocare facility. Therefore, it was reasonable to premise LES's cost estimate on shallow land disposal. Of course, should circumstances arise such that LES chooses to utilize deep geological disposal, we would expect LES to revise its cost estimate to reflect this change in its required decommissioning cost updates.

Q.9. What is your opinion of Dr. Makhijani's testimony regarding the acceptability of the WCS agreement as a basis for estimating the cost of decommissioning?

A.9. (TJ, JM, CD) While the Memorandum of Agreement between LES and WCS is not a binding agreement, there is no requirement that binding agreements must be in place in order to document decommissioning costs, including those for waste disposal. Further, contrary to Dr. Makhijani's claim, we do not consider the MOA to be vague. In fact, the MOA is very specific as to the actions that are expected of each party and contains a specific range for the cost estimate for disposal costs. While these costs could be subject to change in the future, there is no reason to expect that they will necessarily be higher. The Texas Compact Commission, which would be responsible for establishing the exact price for disposal, could establish a price which is lower than that expected by WCS. Based on our knowledge of the nature of the waste to be disposed of and our experience in reviewing cost estimates for disposal of similar waste, we believe that the cost estimate provided in the MOA is reasonable and conservative.

Q.10. Does this conclude your testimony?

A.10. (TJ, JM, CD, JP, DP) Yes.

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	)	

CERTIFICATE OF SERVICE

I hereby certify that copies of "NRC STAFF REBUTTAL TESTIMONY REGARDING DISPOSAL" in the above-captioned proceedings have been served on the following by deposit in the United States mail; through deposit in the Nuclear Regulatory Commission's internal system as indicated by an asterisk (*), and by electronic mail as indicated by a double asterisk (**) on this 11th day of October, 2005.

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Updated October 12, 2005

Louisiana Energy Services, L.P., Docket No. 70-3103-ML
October 2005 Evidentiary Hearing on Contested Issues
Hearing Exhibits

Party Exh. #	Witness/ Panel	Description
Staff 36	Deconversion	NUREG-1790, "Final Environmental Impact Statement for the Proposed National Enrichment Facility in Lea County, New Mexico" (June 2005), Chapters 2 and 4 ("Alternatives" and "Environmental Impacts")
Staff 37	Deconversion	NUREG-1827, "Safety Evaluation Report for the National Enrichment Facility in Lea County, New Mexico" (June 2005), Chapter 10 ("Decommissioning")
LES 82	Deconversion	NUREG-1757, "Consolidated NMSS Decommissioning Guidance" (Sept. 2003), Volume 3 ("Financial Assurance, Recordkeeping, and Timeliness"), pp. iii, 4-1 to 4-11, A-25 to A-30
Staff 38	Deconversion	NUREG/CR-6477, "Revised Analyses of Decommissioning Reference Non-Fuel-Cycle Facilities" (Jul. 1998)
LES 83	Deconversion	National Enrichment Facility Safety Analysis Report, Chapter 10 ("Decommissioning") (most current version)
Staff 39	Deconversion	In-Office Review Summary: LES Decommissioning Fund (April 19, 2005)
LES 97	Deconversion	E-mail from Rod Krich (LES) to James Curtiss (Winston & Strawn LLP) (Nov. 21, 2004), with Attachment, "CaF_2 Disposal Option, prepared by George Harper, Framatome-ANP (Nov. 19, 2004)
Staff 40	Deconversion	Letter from Robert C. Pierson, NRC, to Robert A. Williams, Westinghouse Electric Corp., "Subject: Renewal," (Nov. 3, 1995), enclosing "Safety Evaluation Report for the Renewal of Special Nuclear Material License SNM-1107 for the Westinghouse Electric Corporation Columbia Fuel Fabrication Facility, Columbia, South Carolina" (Sept. 1995) (excerpt).

Party Exh. #	Witness/ Panel	Description
Staff 41	Deconversion	Letter from Robert C. Pierson, NRC, to L.J. Maas, Siemens Power Corporation, "Subject: Renewal," (Nov. 15, 1996), enclosing "Safety Evaluation Report for the Renewal of Special Nuclear Material License SNM-1227 for the Siemens Power Corporation Richland Engineering and Manufacturing Facility, Richland, Washington" (Nov. 1996) (excerpt).
Staff 42	Deconversion	Letter from Michael F. Weber, NRC, to Ralph Reda, "Subject: Safety Evaluation Report: Application dated September 19, 1997, Changes to Table 6.0 for the DCP HF Effluent Recovery and Storage Facility," (Sept. 26, 1997), enclosing "Safety Evaluation Report for the Renewal of Special Nuclear Material License SNM-1097 for the General Electric Company, Nuclear Energy Production, Wilmington, North Carolina" (June 1997) (excerpt).
LES 77	Deconversion	Letter from V. Autry, Director of Division of Waste Management, Bureau of Land and Waste Management, South Carolina Department of Health and Environmental Control, to L. Garner, Regulatory Affairs Coordinator, Starmet CMI (Apr. 1, 1999)
LES 78	Deconversion	Letter from V. Autry, Director of Division of Waste Management, Bureau of Land and Waste Management, South Carolina Department of Health and Environmental Control, to L. Garner, Regulatory Affairs Coordinator, Starmet CMI (June 17, 1999)
LES 76	Deconversion	Slide, AREVA-COGEMA, "Defluorination of Depleted UF_6 – The W defluorination facility" (Sept. 26 2004)
LES 98	Transportation	E-mail from Rod Fisk (Transportation Logistics International, Inc.) to Rod Krich (LES) (Dec. 2, 2004) **[PROPRIETARY]**
LES 99	Transportation	E-mail from Rod Fisk (Transportation Logistics International, Inc.) to Rod Krich (LES) (Mar. 23, 2005)
LES 109	Disposal	Section 4.13 of the NEF Environmental Report, "Waste Management Impacts" (most current revision)(nonproprietary)
LES 103	Disposal	Letter from Al Rafati (Envirocare of Utah, LLC) to E. James Ferland (LES) (February 3, 2005)

Party Exh. #	Witness/ Panel	Description
LES 104	Disposal	Memorandum from Matthew Blevins (NRC) to Scott Flanders (NRC), "Subject: Telephone Summary Regarding Depleted Uranium Disposal", with attached Telephone Summary (Apr. 6, 2005)
LES 105	Disposal	Memorandum of Agreement Between Louisiana Energy Services, L.P. and Waste Control Specialists, LLC" (Jan. 14, 2005) **[PROPRIETARY]**
Staff 43	Disposal	STP-04-003, "NRC Process to Identify Decommissioning Sites with Inadequate Funding for Remediation" (Jan. 2004)
LES 91	Rebuttal Deconversion	Urenco Business Study (Aug. 26, 2004) **[PROPRIETARY]**
NIRS 56	Rebuttal Deconversion	Hatem Elayat, Julie Zoler, Lisa Szytel. "Cost Analysis Report for the Long-Term Management of Depleted Uranium Hexafluoride," UCRL-AC-127650, Livermore, CA: Lawrence Livermore National Laboratory, May 1997.
LES 16	Rebuttal Disposal	"Construction and Operation of a Depleted Uranium Hexafluoride Conversion Facility at the Portsmouth, Ohio Site" (DOE/EIS-0360), Vol. 1
LES 17	Rebuttal Disposal	"Construction and Operation of a Depleted Uranium Hexafluoride Conversion Facility at the Paducah, Kentucky Site" (DOE-EIS-0359), Vol. 1
NIRS 109	Rebuttal Disposal	US EPA, "Waste Characterization Program Documents Applicable to Transuranic Radioactive Waste From the Hanford Site for Disposal at the Waste Isolation Pilot Plant," *available at* http://www.epa.gov/fedrgstr/EPA-WASTE/2001/November/Day-27/f29545.htm
LES 101	Rebuttal Disposal	10 CFR 71, "Licensing Requirements for Land Disposal of Radioactive Waste" (2005)
NIRS 169	Rebuttal Disposal	NUREG-0945, Vol. 1, "Draft Environmental Impact Assessment on 10 CFR 61, 'Licensing Requirements for Land Disposal of Radioactive Waste,'" App. G-Q (Sept. 1981)

Party Exh. #	Witness/ Panel	Description
Staff 44	Rebuttal Disposal	Letter from Dane Finerfrock, State of Utah, Department of Environmental Quality, to Paul Lohaus, NRC, "Subject: Possession Limits of Calibration Source" (Sept. 19, 2005)
Staff 45	Rebuttal Disposal	R.D. Baird, et al., "Evaluation of the Potential Public Health Impacts Associated with Radioactive Waste Disposal at a Site Near Clive, Utah (June 1990)