

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

November 1, 2004
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BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

November 1, 2004 (4:54PM)

OFFICE OF SECRETARY
RULEMAKINGS AND
ADJUDICATIONS STAFF

In the Matter of

Docket No. 70-3103

Louisiana Energy Services, L.P.
National Enrichment Facility

ASLBP No. 04-826-01-ML

SUPPLEMENTAL RESPONSES ON BEHALF OF
PETITIONERS
NUCLEAR INFORMATION AND RESOURCE SERVICE
AND
PUBLIC CITIZEN
TO INTERROGATORIES BY APPLICANT
LOUISIANA ENERGY SERVICES, L.P.

Pursuant to the Memorandum and Order of the Atomic Safety and Licensing Board dated October 20, 2004, Petitioners Nuclear Information and Resource Service and Public Citizen ("NIRS/PC") respond herein to Interrogatories EC-1, question 4 as to the witness George Rice; and EC-5/TC-2, question 4, and EC-7, questions 4-8 as to the witness Charles Komanoff, of the interrogatories served by counsel for the Applicant, Louisiana Energy Services, L.P. ("LES"), on September 9, 2004. The interrogatories, followed by the response by NIRS/PC, are as follows:

Contention EC-1 – Impacts Upon Ground and Surface Water

"Petitioners contend that the Environmental Report (ER) contained in the application does not contain a complete or adequate assessment of the potential environmental impacts of the proposed project on ground and surface water, contrary to the requirements of 10 CFR 51.45."

1. Provide the name, address, profession, employer, and area of professional expertise of each person whom NIRS/PC expects to call as a witness, including any expert witness at the hearing.

2. Provide the educational and scientific expertise of each witness.
3. Provide the subject matter on which each of the witnesses is expected to testify.
4. Provide the substance of the facts and opinions to which each witness is expected to testify and a summary of the grounds for each opinion, including the documents and all pertinent pages or parts thereof upon which each witness will rely or will otherwise use for his testimony.
5. Identify any "waterways," as that term is defined by the Army Corps of Engineers, that you believe are present on the NEF site. Provide all supporting documentation.
6. Define what you consider to be "surface waters." Identify all "surface waters" that are present on the NEF site. Provide all supporting documentation.
7. Provide the basis for the statement in your Petition that water from the evaporation basins will infiltrate into the alluvium, where such basins have installed liners.
8. Provide the basis for the statement in your Petition that "laboratory measurements often underestimate the bulk permeability of a rock body because they do not account for fractures and other features that may act as fast flow paths."
9. Provide the basis for the statement in your Petition that "the water-bearing unit is at a depth of 325 feet."
10. Identify what water supplies would be impacted by the NEF and the distance of such water supplies from the NEF site.

Response: 4. In addition to the matters previously set forth in the petition and in the responses to interrogatories served on September 23, 2004, the following matters will be the subject of testimony by George Rice, an expert hydrologist:

General: The Draft Environmental Impact Statement ("DEIS") and the Environmental Report ("ER") are deficient. Neither LES nor the Commission has performed the investigations necessary to properly characterize existing groundwater conditions. Nor have they performed the investigations necessary to determine how the proposed facility will affect groundwater in the future.

- a. Fault: There is a fault approximately one mile east of proposed NEF site¹. According to G.L. Environmental Inc., this fault passes beneath the site². The Commission and LES

¹ NRC/LES, 2004a, page 3-26, and Harper, G., 2004a.

² G.L. Environmental Inc., 2004, Bates stamp: LES-00122.

have not investigated the potential effects of this fault on groundwater flow at the site (e.g., formation fractures that may act as fast flow paths).

- b. Earthquakes: Earthquakes sometimes occur in the vicinity of the proposed site³. A magnitude 5.0 earthquake, centered 11.0 miles from the site, occurred in 1992⁴. The Commission and LES have not investigated the potential effects of these earthquakes on groundwater flow at the site (e.g., formation of faults or fractures that may act as fast flow paths).
- c. Leakage from storm water detention basin and the septic leach fields: NIRS/PC agree with the Commission that leakage from the storm water detention basin and the septic leach fields will likely result in the formation of perched bodies of groundwater at the alluvial/Chinle interface⁵. The Commission has provided estimates of the dimensions of these bodies, groundwater flow rates, and has identified potential discharge areas⁶. However, the Commission has not provided any information to show how it estimated the dimensions and flow rates, or identified discharge areas. The Commission should provide all calculations, assumptions, and other information associated with these estimates.
- d. Leakage from lined basins: Treated effluent from the plant will be discharged to a double lined evaporation basin⁷. Stormwater runoff from the uranium byproduct cylinder ("UBC") storage pad and cooling tower blowdown will be discharged to a single lined evaporation basin⁸. The basins will be lined with geosynthetic materials (e.g., high

³ NRC/LES, 2004a, page 3-27.

⁴ Louisiana Energy Services, 2004a, table 3.3-3.

⁵ NRC/LES, 2004a, pages 4-13 and 4-14.

⁶ One of the potential discharge areas, Custer Mountain, is approximately 20 miles south of the site (Nicholson and Clebsch, 1961, plate 2).

⁷ NRC/LES, 2004a, page 4-11.

⁸ NRC/LES, 2004a, page 4-12.

density polyethylene, "HDPE")⁹. However, lined basins often leak¹⁰. The leakage may be due to manufacturing defects in the geosynthetic liner, installation defects, or deterioration of the liner after it is installed. The EPA recently released a report describing various methods for detecting leaks beneath lined landfills and impoundments¹¹. Laine and Miklas examined 61 geosynthetic-lined facilities¹². The facilities included landfills and impoundments. Most of the geosynthetic-liners were made of HDPE, but some were made of poly vinyl chloride ("PVC")(e.g., XR-5) or polyethylene. Leaks were detected in 58 of the 61 facilities. The average density of leaks at all facilities was about 13 per acre. In this case, the Commission and LES have not estimated the rate at which the lined basins may leak. Nor have they determined the fate of the water and contaminants (e.g., flow rates, discharge areas) that may leak from the basins. The Commission and LES should estimate leakage rates from the lined basins and determine the fate of the water and contaminants that may leak from the basins.

- e. Water bearing unit at 600 feet: According to the Commission staff, there is a 100 foot-thick water-bearing sandstone layer at a depth of about 600 feet¹³. However, the Commission has not answered basic questions about this water-bearing layer, including:
1. Does it exist below the proposed site?
 2. What are the hydraulic properties?
 3. What is the quality of the water?
 4. Where does the water discharge?

⁹ Louisiana Energy Services, 2004b, pages 11 – 13 of 36.

¹⁰ EPA 1994a, pages 33 – 35.

¹¹ EPA, 2004a.

¹² Laine and Miklas, 1989.

¹³ NRC/LES, 2004a, page 3-36.

- f. Source of moisture in alluvium: According to the Commission staff, "... no precipitation recharge (i.e., rainfall seeping deeply into the ground) occurs in thick, desert vadose zones with desert vegetation (Walvoord et al., 2002)"¹⁴. However, cuttings from one of the borings drilled in September 2003 were "slightly moist"¹⁵. In addition, the clay at the bottom of boring B-2 was "moist"¹⁶. If the Commission does not believe this moisture is the result of 'precipitation recharge', it should explain the origin of this moisture.
- g. Measured permeabilities and fractures: The Commission staff states: "Although the presence of fracture zones that can significantly increase vertical water transport through the Chinle Formation has not been precluded, the low measured permeabilities indicate the absence of such zones."¹⁷ Two types of permeability measurements have been performed on the Chinle Formation near the site. One type appears to be laboratory measurements of core samples¹⁸. The other is a slug test performed in MW-2¹⁹. However, laboratory measurements often underestimate the bulk permeability of a unit because they do not account for fractures and other features that may act as fast flow paths²⁰. Slug tests only measure hydraulic properties in the area immediately surrounding the well²¹. The Commission should explain how such limited measurements could be expected to reveal the presence of fractures that may be spaced at intervals of five feet, ten feet, or more.

¹⁴ NRC/LES, 2004a, page 3-35.

¹⁵ Louisiana Energy Services, 2004a, page 3.4-2. Cuttings from depths of 6 – 14 feet.

¹⁶ Louisiana Energy Services, 2003b, figure 3.2-11. Moist clay at depth of about 35 feet.

¹⁷ NRC/LES, 2004a, page 3-35.

¹⁸ Louisiana Energy Services, 2004a, table 3.3-2. These core samples may have been collected at the nearby WCS site.

¹⁹ Cook-Joyce Inc., 2003a, page 8.

²⁰ Linsley, Kohler, and Paulhus, 1958, page 131; Davis and DeWiest, 1966, page 165; Olson, R.E., D.E. Daniel, 1981, page 20.

²¹ EPA, 1994b, page 1.

- h. Zones to be monitored: The Commission has not clearly stated which groundwater zones will be monitored. The DEIS states that groundwater in the 220-foot zone will be monitored²², but does not state that perched bodies of groundwater which form at the alluvial/Chinle interface will be monitored. The perched groundwater should also be monitored.
- i. Quality of storm water runoff: The water discharged to stormwater basin may contain a wide variety of contaminants. According to LES's ER RAI Response of May 20, 2004, the discharge to the stormwater basin ... *will be typical of runoff from building roofs and paved areas from any industrial facility.*²³ The discharge will include ... *small amounts of oil and grease typically found in runoff from paved roadways and parking areas, ...*²⁴ The discharge may also contain pesticides and fertilizers that will be applied around the facility²⁵. In addition, the discharge may contain other contaminants associated with roads, parking lots and industrial facilities. These include: PAHs²⁶, other organic compounds (e.g., aliphatic hydrocarbons, alcohols)²⁷, and miscellaneous contaminants resulting from spills and accidents. However, the Stormwater Monitoring Program²⁸ does not include monitoring of PAHs, pesticides, or other organics. The Commission and LES should include these potential contaminants in the Stormwater Monitoring Program.
- j. New Documents: The following are new items reviewed in connection with these opinions:

²² NRC/LES, 2004a, page 6-13.

²³ LES, 2004c, page 33.

²⁴ LES, 2004c, page 33.

²⁵ Lockwood Greene, 2004a, page 4.

²⁶ USGS, 2004a, table 3.

²⁷ Barrett et al., 1993, table 3.5.

²⁸ NRC/LES, 2004a, page 6-18.

1. Barrett, M.E., R.D. Zuber, E.R. Collins, J.F. Malina, Jr., R.J. Charbeneau, and G.H. Ward, 1993, *A Review and Evaluation of Literature Pertaining to the Quality and Control of Pollution from Highway Runoff and Construction*, Technical Report CRWR 239, April 1993.
2. Cook-Joyce Inc., 2003a, *Hydrogeologic Investigation, Section 32; Township 21 range 38, Eunice New Mexico*, 19 November, 2003.
3. EPA, 1994a, *The Hydrologic Evaluation of Landfill Performance (HELP) Model, User's Guide for Version 3*, EPA/600/R-94/168a, September 1994.
4. EPA, 1994b, *Slug Tests*, SOP# 2046, October 3, 1994.
5. EPA, 2004a, *Survey of Technologies for monitoring Containment Liners and Covers*, EPA 542-R-04-013, June 2004.
6. G.L. Environmental Inc., 2004, *Comments on New Mexico Ground Water Discharge Permit*, attached to an email sent to George Harper, April 6, 2004.
7. Harper, G., 2004a, statements in deposition taken on September 17, 2004.
8. Laine, D.L., and M.P. Miklas, Jr., 1989, *Detection and Location of Leaks in Geomembrane Liners Using an Electrical Method: Case Histories*, Southwest Research Institute, San Antonio, Texas, Proceedings of the 10th National Conference, Superfund '89, Washington, D.C., U.S.A., Nov. 27-29, 1989, http://www.leaklocationservices.com/pubs/detection_location.pdf
9. Lockwood Greene, 2004a, *Data/Information for Environmental Permit*, document number L4-50-01-RES, March 29, 2004, Bates stamp: LES-00768 – LES-00781.
10. Louisiana Energy Services, 2004a, *National Enrichment Facility Environmental Report*; Revision 2, July 2004.

11. Louisiana Energy Services, 2004b, *Ground Water Discharge Permit Application*, April 26, 2004.
12. Louisiana Energy Services, 2004c, *Response to NRC/LES Request for Additional Information Regarding the National Enrichment Facility Environmental Report*, letter NEF#04-019, May 20, 2004.
13. Nuclear Regulatory Commission, 2004a, *Environmental Impact Statement for the Proposed National Enrichment Facility in Lea County, New Mexico, Draft Report for Comment*, NUREG-1790, September 2004.
14. Olson, R.E., D.E. Daniel, 1981, *Measurement of the Hydraulic Conductivity of Fine-Grained Soils*, in "Permeability and Groundwater Contaminant Transport", Zimmie and Riggs, editors, ASTM Special Technical Publication 746.
15. USGS, 2004a, *Concentrations of Polycyclic Aromatic Hydrocarbons (PAHs) and Major and Trace Elements in Simulated Rainfall Runoff from Parking Lots, Austin, Texas, 2003*, Open File report 2004-1208.

Contention EC-5/TC-2 – AGNM TC-I – Decommissioning Costs

"Louisiana Energy Services, L.P. (LES) has presented estimates of the costs of decommissioning and funding plan as required by 42 USC 2243 and 10 CFR 30.35, 40.36, and 70.25 to be included in a license application. See Safety Analysis Report 10.0 through 10.3; ER 4.13.3. Petitioners contest the sufficiency of such presentations as based on (1) a contingency factor that is too low; (2) a low estimate of the cost of capital; and (3) an incorrect assumption that the costs are for low-level waste only."

1. Provide the name, address, profession, employer, and area of professional expertise of each person whom NIRS/PC expects to call as a witness, including any expert witness at the hearing.
2. Provide the educational and scientific expertise of each witness.
3. Provide the subject matter on which each of the witnesses is expected to testify.
4. Provide the substance of the facts and opinions to which each witness is expected to testify and a summary of the grounds for each opinion, including

the documents and all pertinent pages or parts thereof upon which each witness will rely or will otherwise use for his testimony.

Response: 4. Mr. Komanoff is still in the research phase of his investigation. From Chapter 10 of the Safety Analysis Report, Mr. Komanoff understands that the Applicant ("LES") estimated that it will cost \$837 million to decommission the National Enrichment Facility ("NEF") (in January 2002 dollars). This estimate appears to have been based directly on cost data developed at Urenco in Europe and based upon "Urenco decommissioning experience" in Europe. The contractors who prepared estimates of the cost of decommissioning the NEF appear to have made few adjustments in applying such data to a new U.S. plant, to be decommissioned in the 2030's. From the materials provided by LES that Mr. Komanoff has reviewed to date, it does not appear that LES made any adjustments for the following factors: (i) possible differences in regulatory criteria between Europe and the United States; (ii) possible differences in regulatory criteria between the earlier period[s] in which Urenco decommissioning activities were carried out in Europe and the later period in which the NEF will be decommissioned; (iii) possible differences between the location[s] in which Urenco decommissioning activities were carried out in Europe and the NEF's remote location. In addition, decommissioning standards are likely to be further constrained for NEF, vis-à-vis the standards that applied in Urenco's European data, (iv) because of new emphases in the U.S. on security, and (v) because first-of-a-kind activities, such as the NEF decommissioning, tend to be particularly scrutinized in the U.S., causing additional delays and cost increases. These omissions and others to be identified as investigation is completed, Mr. Komanoff expects, will tend to show that the allowance for contingencies contained in the cost estimate by LES is not adequate to account for potential cost increases. Mr. Komanoff expects to draw upon documents such as E.W. Merrow et al., *Understanding Cost Growth and Performance Shortfalls in Pioneer Process Plants*, Rand Corp., R-2569-DOE, 1981.

Contention EC-7 – Need for the Facility

“Petitioners contend that the Environmental Report (ER) does not adequately describe or weigh the environmental, social, and economic impacts and costs of operating the National Enrichment Facility (See ER 1.1.1 et seq.) in that:

- (A) Louisiana Energy Services, L.P.’s (LES) presentation erroneously assumes that there is a shortage of enrichment capacity.
- (B) LES’s statements of “need” for the LES plant (ER 1.1) depend primarily upon global projections of need rather than projections of need for enrichment services in the U.S.
- (C) LES has referred to supply and demand in the uranium enrichment market (ER 1.1), but it has not shown how LES would effectively enter this market in the face of existing and anticipated competitors and contribute some public benefit.
 - 1. Provide the name, address, profession, employer, and area of professional expertise of each person whom NIRS/PC expects to call as a witness, including any expert witness at the hearing.
 - 2. Provide the educational and scientific expertise of each witness.
 - 3. Provide the subject matter on which each of the witnesses is expected to testify.
 - 4. Provide the substance of the facts and opinions to which each witness is expected to testify and a summary of the grounds for each opinion, including the documents and all pertinent pages or parts thereof upon which each witness will rely or will otherwise use for his testimony.
 - 5. Provide the basis for your conclusion that there is no shortage of enrichment capacity, including any projections or estimates that have been made regarding the demand for enrichment services and the supply of enrichment services available to meet this demand over the period of time that the National Enrichment Facility will be in operations. Provide any estimates or projections that you have made regarding “global projections” versus “U.S. projections of enrichment demand. Identify all assumptions that have been made in your projections or estimates. Provide all analyses performed by David Osterberg and Dr. Arjun Makhijani.
 - 6. Identify all “existing and anticipated competitors” referred to in this contention.
 - 7. Provide the basis for the statement in your Petition that “[t]here is no indication that needs of U.S. nuclear utilities cannot be met without construction and operation of the LES facility.” Identify all conversations, consultations, correspondence or any other type of communication that you have had with representatives of, or consultants to, U.S. nuclear utilities.
 - 8. Define what is meant by the statement in your Petition “it has not been shown how LES will effectively enter this market . . . “

Response: 4. Mr. Komanoff is developing a forecast of world uranium enrichment-services demand and supply, with which to examine the asserted need for the NEF and the benefits that LES claims it would provide. His demand analysis draws on published forecasts of future world nuclear power capacity and generation, filtered through his informed professional judgment and knowledge of the factors affecting the use of nuclear power plants in the U.S. and around the world. His supply analysis similarly reflects his assessments of the likelihood of completion and operation of the various enrichment facilities existing and proposed in the world and estimates of the costs of production applicable to the various supply sources, along with estimates of the extent to which the U.S. and Russian stocks of highly enriched uranium will be downblended to provide nuclear fuel.

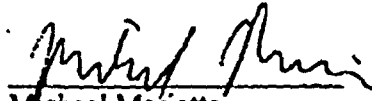
5. As the analyses outlined above are still in process, it would be premature to answer the question as to the extent of a claimed shortage definitively at this time. Based on the progress of the analyses thus far, Mr. Komanoff expects to conclude that world needs for uranium enrichment services can be met absent the NEF facility, without incurring any economic penalty.

6. On present information, the existing and anticipated competitors included in Mr. Komanoff's analysis include but are not limited to: USEC, Inc. (both the existing Paducah gaseous diffusion plant and the proposed new American Centrifuge facility), the Eurodif gaseous diffusion plant, planned Areva/Cogema centrifuge capacity, other Urenco facilities in Europe, facilities owned and operated by Russia/Tenex, and Russian and U.S. stocks of highly-enriched uranium.

7. The basis for the statement in question will be provided in the supply and demand analysis now being conducted, as will appear in Mr. Komanoff's prefiled testimony. At present Mr. Komanoff has had no communications with consultants to or representatives of U.S. electric utility companies regarding uranium enrichment demand or supply.

8. The quoted language does not appear in the Petition. The Petition contains the following language as a basis for Contention 5: "LES has referred to supply and demand in the uranium enrichment market (ER 1.1), but it has not provided a business plan that shows how LES would effectively enter this market in the face of existing and anticipated competitors and contribute some public benefit." The language contained in the interrogatory appears in the contention as revised by the Atomic Safety and Licensing Board, Memorandum and Order, at 43, July 19, 2004. The revised contention states, in substance, that the cost-benefit analysis required by NEPA has not been presented in the Environmental Report.

The foregoing responses are true and correct to the best of my knowledge.



Michael Mariotte
Executive Director
Nuclear Information and Resource Service

Respectfully submitted,



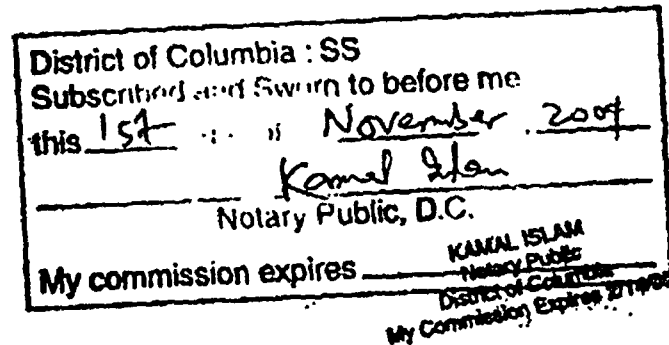
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November 1, 2004



CERTIFICATE OF SERVICE

Pursuant to 10 CFR § 2.305 the undersigned attorney of record certifies that on November 1, 2004, the foregoing Supplemental Responses on Behalf of Petitioners Nuclear Information and Resource Service and Public Citizen to Interrogatories by Applicant Louisiana Energy Services, L.P., was served by electronic mail and by first class mail upon the following:

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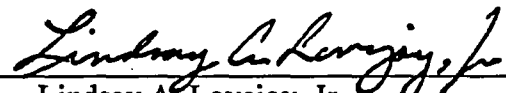
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