February 14, 2000

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of	)	
	)	
PRIVATE FUEL STORAGE, LLC	)	Docket No. 72-22-ISFSI
	)	
(Independent Spent	)	
Fuel Storage Installation)	)	

NRC STAFF'S OBJECTIONS AND RESPONSES TO THE "STATE OF UTAH'S SIXTH SET OF DISCOVERY REQUESTS DIRECTED TO THE NRC STAFF (UTAH CONTENTION L)"

INTRODUCTION

On February 4, 2000, the State of Utah ("State") filed the "State of Utah's Sixth Set of Discovery Requests Directed to the NRC Staff (Utah Contention L)" ("Sixth Request"), concerning the application for an Independent Spent Fuel Storage Installation ("ISFSI") filed by Private Fuel Storage, L.L.C. ("PFS" or "Applicant"). In its Request, the State filed (a) five general interrogatories concerning all of its admitted contentions in this proceeding, and (b) 16 requests for admission and four interrogatories concerning Contention Utah L (geotechnical). The NRC Staff ("Staff") hereby files its objections and responses to the State's Request, as follows.

GENERAL OBJECTIONS

Objection 1. The Staff objects to each of the State's discovery requests, in that the State has not complied with the Commission's regulations that govern discovery from the Staff. In this regard, it is well established that discovery against the Staff rests on a different footing than discovery in

general. *Consumers Power Co.* (Midland Plant, Units 1 and 2), ALAB-634, 13 NRC 96, 97-98 (1981). While discovery from parties in an NRC adjudicatory proceeding is generally governed by the provisions of 10 C.F.R. § 2.740 *et seq.*, interrogatory and document discovery against the Staff is governed by the provisions of 10 C.F.R. §§ 2.720(h)(ii)-(iii), 2.744 and 2.790.[1] These regulations establish certain limits to the Staff's obligation to respond to requests for discovery.

In particular, with regard to interrogatories, the Commission's rules provide:

> [A] party may file with the presiding officer written interrogatories to be answered by NRC personnel with knowledge of the facts designated by the Executive Director for Operations. Upon a finding by the presiding officer that answers to the interrogatories are necessary to a proper decision in the proceeding and that answers to the interrogatories are not reasonably obtainable from any other source, the presiding officer may require that the staff answer the interrogatories.

10 C.F.R. § 2.720(h)(2)(ii). With regard to requests for the production of documents, the Commission's rules similarly provide:

> (a) A request for the production of an NRC record or document not available pursuant to 10 C.F.R. § 2.790 . . . . shall set forth the records or documents requested, either by individual item or by category, and shall describe each item or category with reasonable particularity and shall state why that record or document is relevant to the proceeding.
>
> (b) If the Executive Director for Operations objects to producing a requested record or document on the ground that (1) it is not relevant or (2) it is exempted from disclosure under § 2.790 and the disclosure is not necessary to a proper decision in the proceeding or the document or the information therein is reasonably obtainable from another source, he shall so advise the requesting party.

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[1] *See also* 10 C.F.R. §§ 2.740(f)(3), 2.740a(j), 2.740b(a), and 2.741(e) (excluding discovery from the Staff from the general provisions of those regulations).

10 C.F.R. § 2.744(b). The rule further provides for application by the requesting party to the presiding officer to compel production of the documents, where the movant shows that the document is relevant to the issues in the proceeding; and the document is not exempt from disclosure under 10 C.F.R. § 2.790 -- or, if exempt, that the document or information is necessary to a proper decision in the proceeding and is not reasonably obtainable from another source. 10 C.F.R. §§ 2.744(c)-(d).[2]

Moreover, it is an adequate response to *any* discovery request for a party to state that the information or document requested is available in the public domain and to provide information to locate the material requested. 10 C.F.R. § 2.740(b)(1); *accord, Metropolitan Edison Co.* (Three Mile Island Nuclear Station, Unit No. 1), CLI-79-8, 10 NRC 141, 147-148 (1979).

Here, the State has not complied with any of the Commission's requirements governing discovery against the Staff. First, the State has not indicated that the requested documents and information are not available in the public domain. Indeed, many of the documents requested by the State are available to the public at the Commission's Public Document Room (PDR) or the Local PDR (LPDR) in Salt Lake City. The State has not indicated that the requested information and documents are exempt from disclosure under 10 C.F.R. § 2.790 or that it can not obtain the documents from public sources. Similarly, to the extent that any documents may be exempt from disclosure, the State has not explained why any such exempt items are necessary to a proper decision in the proceeding. Finally, to the extent that the instant discovery requests seek information that has been withheld from public disclosure as PFS' proprietary information, the State has been afforded

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[2] Additionally, 10 C.F.R. § 2.744(e) provides a framework for limited disclosure (under a protective order) of documents exempt from disclosure under 10 C.F.R. § 2.790, upon a finding by the presiding officer that such disclosure is necessary to a proper decision in the proceeding. *Cf.* 10 C.F.R. § 2.740(c).

access to that material by the Applicant under a confidentiality agreement, and the State has shown no reason why it could not obtain the requested information from the Applicant.

Objection 2. The Staff objects to each of the State's discovery requests, insofar as they request information that is not relevant to the issues in this proceeding and/or that exceeds the scope of admitted contentions in this proceeding.

Objection 3. The Staff objects to the State's discovery requests insofar as they relate to matters which are outside the jurisdiction of the NRC and/or are beyond the proper scope of this proceeding.

Objection 4. The Staff objects to each of the State's discovery requests, insofar as they request information or documents from the "Nuclear Regulatory Commission," "NRC," or other persons or entities who are not NRC Staff members or consultants in this proceeding. *See, e.g.*, Definition A (Request at 4). The NRC and persons other than Staff members (*e.g.*, Commissioners, Commissioners' Assistants, Licensing Board members, ACRS members, etc.) are not parties to this proceeding and are not properly subject to the State's requests for discovery in this proceeding.

Objection 5. The Staff objects to each of the State's discovery requests, insofar as they seek to impose an obligation to respond that is different from or greater than the obligations imposed by Commission requirements in 10 C.F.R. Part 2. *See, e.g.*, Instruction B, "Lack of Information" (Request at 2).

Objection 6. The Staff objects to each of the State's discovery requests, insofar as they may request information or documents protected under the attorney-client privilege, the doctrines governing the disclosure of attorney work product and trial preparation materials, and/or any other privilege or exemption that warrants or permits the non-disclosure of documents under the Freedom

of Information Act, as set forth in 10 C.F.R. § 2.790(a). Notwithstanding this objection, the Staff is preparing a privilege log to identify documents that are sought to be withheld from discovery as privileged, and will produce that log to the State.

Objection 7. The Staff objects to each of the State's discovery requests, insofar as they all pertain to Contention Utah L (geotechnical), which is an issue that remains the subject of an ongoing NRC Staff review and as to which the Staff has not yet stated a position. In accordance with the Licensing Board's scheduling orders in this proceeding, discovery against the Staff on a contention is to be deferred until after the Staff has stated its position with respect to that contention. *See, e.g.*, "Order (General Schedule Revision and Other Matters)," dated February 2, 2000, Attachment "A" (discovery against the Staff on Contention Utah L "begins September 15, 2000").

RESPONSES TO DISCOVERY REQUESTS

Notwithstanding the above objections to the State's Request, and without waiving these objections or its right to interpose these or other objections in the future, the Staff hereby voluntarily provides the following responses to the State's Request.

A. GENERAL DISCOVERY

To the extent that the Staff now has updated information for, or has not already answered the general interrogatories in the State's first set of discovery requests, please answer or supplement the following:

GENERAL INTERROGATORIES
These general interrogatories apply to all Utah admitted contentions, are in addition to the ten interrogatories per contention allowed by the Board's Order dated April 22, 1998 (LBP-98-7), and are continuing in accordance with 10 CFR § 2.740(e).

GENERAL INTERROGATORY NO. 1 State the name, business address, and job title of each person who was consulted and/or who supplied information for responding to interrogatories and requests

for admissions. Specifically note for which interrogatories and requests for admissions each such person was consulted and/or supplied information.

If the information or opinions of anyone who was consulted in connection with your response to an interrogatory or request for admission differs from your written answer to the discovery request, please describe in detail the differing information or opinions, and indicate why such differing information or opinions are not your official position as expressed in your written answer to the request.

GENERAL INTERROGATORY NO. 2. Identify all documents relevant to any Utah admitted contention upon which NRC Staff intends to rely in litigating each Utah contention.

GENERAL INTERROGATORY NO. 3. For each admitted Utah contention, give the name, address, profession, employer, area of professional expertise, and educational and scientific experience of each person whom NRC Staff expects to call as a witness at the hearing. For purposes of answering this interrogatory, the educational and scientific experience of expected witnesses may be provided by a resume of the person attached to the response.

GENERAL INTERROGATORY NO. 4. For each admitted Utah contention, identify the qualifications of each expert witness whom NRC Staff expects to call at the hearing, including but not limited to a list of all publications authored by the witness within the preceding ten years and a listing of any other cases in which the witness has testified as an expert at a trial, hearing or by deposition within the preceding four years.

GENERAL INTERROGATORY NO. 5. For each admitted Utah contention, describe the subject matter on which each of the witnesses is expected to testify at the hearing, describe the facts and opinions to which each witness is expected to testify, including a summary of the grounds for each opinion, and identify the documents (including all pertinent pages or parts thereof), data or other information which each witness has reviewed and considered, or is expected to consider or to rely on for his or her testimony.

STAFF RESPONSE. These interrogatories, which pertain to all of the State's admitted contentions, reiterate, almost *verbatim*, the general interrogatories contained in the "State of Utah's

First Set of Discovery Requests Directed to the NRC Staff" ("First Request"), dated June 10, 1999.[3] Indeed, the State appears to have intended to restate those earlier interrogatories herein.[4] The Staff objects to being served with two requests to respond to the same interrogatories, as repetitious and burdensome, particularly in light of the supplementation of discovery responses required under 10 C.F.R. §2.740(e). Notwithstanding this objection, however, the Staff will review its answers to the State's First Request, and will provide a supplement thereto, as appropriate and required under the Commission's regulations.

B. CONTENTION L - GEOTECHNICAL

1. Requests for Admission - Utah Contention L

> REQUEST FOR ADMISSION NO. 1 - UTAH L. Do you admit that the Deterministic Seismic Hazard Analysis (DSHA) performed by Geomatrix Consultants, Inc., and reported in Appendix 2D of the 1997 SAR deviated from established precedent in meeting requirements of 10 CFR 72.102(f)(1) and 10 CFR 100 Appendix A for assessing the maximum vibratory ground motion at the PFS site by incorporating uncertainty in the maximum magnitude, minimum source-to-site distance, and choice of ground-motion attenuation relationship in estimating the 84th-percentile ground motions?

STAFF RESPONSE. The Staff objects to this request on the grounds that it is vague and ambiguous. Notwithstanding this objection, the Staff states that the Geomatrix DSHA did not meet the deterministic requirements in 10 C.F.R. Part 100 Appendix A.

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[3] The two sets of general interrogatories differ only in that the State's Sixth Request (a) deletes the phrase "requests for the production of documents" in General Interrogatory No. 1 (which seeks the names of persons who were consulted and/or who supplied information concerning the State's discovery requests, and (b) adds the word "Staff" following "NRC" in General Interrogatory 4 of the State's Sixth Request.

[4] *See* the State's introductory instruction for responding to these general interrogatories, *supra* at 5 (quoting Sixth Request at 7).

> REQUEST FOR ADMISSION NO. 2 - UTAH L. Do you admit that the updated DSHA performed by Geomatrix Consultants, Inc. and reported in the April 1999 "Update of Deterministic Ground Motion Assessments" (Commitment Resolution #3) also deviated from established precedent in meeting requirements of 10 CFR 72.102(f)(1) and 10 CFR 100 Appendix A for assessing the maximum vibratory ground motion at the PFS site by incorporating uncertainty in the maximum magnitude, minimum source-to-site distance, and choice of ground-motion attenuation relationship in estimating the 84th-percentile ground motions?

STAFF RESPONSE. The Staff objects to this request on the grounds that it is vague and ambiguous. Notwithstanding this objection, the Staff states that the updated Geomatrix DSHA did not meet the deterministic requirements in 10 C.F.R. Part 100 Appendix A.

> REQUEST FOR ADMISSION NO. 3 - UTAH L. Do you admit that synchronous coseismic rupture of the Stansbury fault with the East and/or West faults could lead to larger vibratory ground motion than for independent rupture of the individual faults?

STAFF RESPONSE. The Staff lacks sufficient information to admit or deny the statement contained in this request.

> REQUEST FOR ADMISSION NO. 4 - UTAH L. Do you admit that there are inadequate data and information to establish that the Stansbury fault ruptures independently of the East and/or West faults?

STAFF RESPONSE. The Staff lacks sufficient information to admit or deny the statement contained in this request.

> REQUEST FOR ADMISSION NO. 5 - UTAH L. Do you admit that there is an NRC Rulemaking Plan (SECY-98-128) to amend certain sections in 10 CFR 72.102 and 72.212(b) relating to the geological and seismological characteristics for siting and design of dry cask ISFSIs?

STAFF RESPONSE. No; however, such a rulemaking plan is described in SECY-98-126.

> REQUEST FOR ADMISSION NO. 6 - UTAH L. Do you admit that under SECY-98-128 there are only two types of design basis events: Frequency-Category-1 and Frequency-Category-2?

STAFF RESPONSE. *See* response to Request for Admission No. 5, *supra*. The Staff objects to this request on the grounds that the State has shown no reason why it could not obtain the requested information from other sources, including, without limitation, the referenced document, which speaks for itself.

> REQUEST FOR ADMISSION NO. 7 - UTAH L. Do you admit that SECY-98-128 defines Frequency-Category-1 seismic events as events with ground motions having a mean annual probability of exceedance of 1×10^{-3}, which corresponds to a 1,000-year return period?

STAFF RESPONSE. *See* response to Request for Admission No. 5, *supra*. The Staff objects to this request on the grounds that the State has shown no reason why it could not obtain the requested information from other sources, including, without limitation, the referenced document, which speaks for itself.

> REQUEST FOR ADMISSION NO. 8 - UTAH L. Do you admit that SECY-98-128 defines Frequency-Category-2 seismic events as events with ground motions having a mean annual probability of exceedance of 1×10^{-4}, which corresponds to a 10,000-year return period?

STAFF RESPONSE. *See* response to Request for Admission No. 5, *supra*. The Staff objects to this request on the grounds that the State has shown no reason why it could not obtain the requested information from other sources, including, without limitation, the referenced document, which speaks for itself.

> REQUEST FOR ADMISSION NO. 9 - UTAH L. Do you admit that the Staff rejected PFS's proposal to use a design earthquake with ground motions having a return period of 1,000 years, as determined by a probabilistic seismic hazard analysis?

STAFF RESPONSE. The Staff objects to this request on the grounds that it is vague and ambiguous. Notwithstanding this objection, the Staff states as follows: No.

> REQUEST FOR ADMISSION NO. 10 - UTAH L. Do you admit that the Rulemaking Plan, SECY-98-128, does not include the use of design earthquakes with ground motions having a return period of 2,000 years for dry cask storage at an ISFSI site?

STAFF RESPONSE. *See* response to Request for Admission No. 5, *supra*. The Staff objects to this request on the grounds that the State has shown no reason why it could not obtain the requested information from other sources, including, without limitation, the referenced document, which speaks for itself.

> REQUEST FOR ADMISSION NO. 11 - UTAH L. Do you admit that the standard of using peak ground motion values that have a 90-percent probability of not being exceeded in 50 years for the seismic design of structures, as recommended by the Uniform Building Code and the National Earthquake Hazards Reduction Program (International Conference of Building Officials, 1994; Building Seismic Safety Council, 1995) (collectively "Building Codes") and as cited by the Staff in the SER at 2-45, has been superseded by more stringent standards in later and/or pending versions of those Building Codes?

STAFF RESPONSE. The Staff objects to this request on the grounds that (a) it is vague and ambiguous, (b) it constitutes an impermissible compound question, (c) it mischaracterizes the Building Seismic Safety Council document as a "building code," and (d) the State has shown no reason why it could not obtain the requested information from other sources, including, without limitation, the referenced documents, which speak for themselves.

> REQUEST FOR ADMISSION NO. 12 - UTAH L. Do you admit that the building-code standards for seismic safety cited by the Staff in the SER at 2-45 are intended to provide minimum life-safety standards for buildings and structures occupied by humans and are not intended for high-level nuclear waste storage facilities?

STAFF RESPONSE. The Staff objects to this request on the grounds that (a) it is vague and ambiguous, (b) it constitutes an impermissible compound question, (c) it mischaracterizes the Building Seismic Safety Council document as a "building code," and (d) the State has shown no reason why it could not obtain the requested information from other sources, including, without limitation, the referenced documents, which speak for themselves.

> REQUEST FOR ADMISSION NO. 13 - UTAH L. Do you admit that the occurrence of vibratory ground motions exceeding design basis ground motions with an estimated average return period of 2,000 years should be considered a credible event?

STAFF RESPONSE. The Staff objects to this request on the grounds that it (a) is vague and ambiguous, and (b) constitutes an impermissible compound question.

> REQUEST FOR ADMISSION NO. 14 - UTAH L. Do you admit that the occurrence of vibratory ground motions exceeding design basis ground motions with an estimated average return period of 10,000 years should be considered a credible event?

STAFF RESPONSE. The Staff objects to this request on the grounds that it (a) is vague and ambiguous, and (b) constitutes an impermissible compound question.

> REQUEST FOR ADMISSION NO. 15 - UTAH L. Do you admit that the occurrence of vibratory ground motions exceeding design basis ground motions developed from 84th percentile deterministic ground motions should be considered a credible event?

STAFF RESPONSE. The Staff objects to this request on the grounds that it (a) is vague and ambiguous, and (b) constitutes an impermissible compound question.

REQUEST FOR ADMISSION NO. 16 - UTAH L. Do you admit that tipover of spent fuel storage casks at the proposed PFS ISFSI should be considered a credible event?

STAFF RESPONSE. The Staff objects to this request on the grounds that it (a) is vague and ambiguous, and (b) constitutes an impermissible compound question.

2. Interrogatories - Utah Contention L

INTERROGATORY NO. 1 - UTAH L. If 10 CFR 72.102(f)(1) and 10 CFR 100 Appendix A, as currently in effect, were to apply and require a deterministic assessment of the maximum vibratory ground motion at the PFS site for the design earthquake, please explain whether the Staff considers that the 1999 updated DSHA performed by Geomatrix Consultants, Inc., would fully meet the foregoing requirements, despite a probabilistic treatment of maximum magnitude, minimum source-to-site distance, and ground-motion attenuation relationships.

STAFF RESPONSE. The Staff objects to this request on the grounds that it (a) is vague and ambiguous, and (b) constitutes an impermissible compound question. Notwithstanding this objection, the Staff states as follows: No.

INTERROGATORY NO. 2 -UTAH L. Insofar as the seismic source characterization models used by Geomatrix Consultants, Inc., in both its updated "deterministic" and probabilistic seismic hazard analyses for vibratory ground motion at the PFS site do not include the scenario of synchronous coseismic rupture of the Stansbury fault with the East and/or West faults, please explain whether the Staff considers those analyses to be sufficiently conservative. The Staff's explanation should include the basis or rationale for its response.

STAFF RESPONSE. The Staff lacks sufficient information to respond to this interrogatory.

INTERROGATORY NO. 3 - UTAH L. If Requests for Admissions 13, 14, or 15 is admitted, please describe what the Staff would consider to be acceptable means for determining, in the aftermath of a seismic event, whether or not the design basis ground motions had been exceeded.

STAFF RESPONSE. *See* Responses to Requests for Admission Nos. 13, 14 and 15, *supra*. The Staff objects to this request on the grounds that it (a) is vague and ambiguous, and (b) constitutes an impermissible compound question.

> INTERROGATORY NO. 4 - UTAH L. If Request for Admission No. 16 is admitted, please describe what the Staff would consider to be acceptable ways to mitigate the hazard of cask tipover.

STAFF RESPONSE. *See* Response to Request for Admission No. 16, *supra*. The Staff objects to this request on the grounds that it (a) is vague and ambiguous, and (b) constitutes an impermissible compound question.

Respectfully submitted,

Sherwin E. Turk
Counsel for NRC Staff

Dated at Rockville, Maryland
this 14th day of February 2000

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of	)	
	)	
PRIVATE FUEL STORAGE, L.L.C.	)	Docket No. 72-22-ISFSI
	)	
(Independent Spent Fuel	)	
Storage Installation)	)	

AFFIDAVIT OF JOHN STAMATAKOS

COUNTY OF BEXAR	)	
	)	SS:
STATE OF TEXAS	)	

John Stamatakos, having first been duly sworn, does hereby state as follows:

1. I am employed as a Senior Research Scientist at the Center for Nuclear Waste Regulatory Analysis (CNWRA), which is division of the Southwest Research Institute (SwRI), in San Antonio, Texas. I am providing this affidavit under a technical assistance contract between the NRC Staff and SwRI. A statement of my professional qualifications is attached hereto.

2. I have reviewed the foregoing NRC Staff responses to the "State of Utah's Sixth Set of Discovery Requests Directed to the NRC Staff (Utah Contention L)," and verify that they are true and correct to the best of my knowledge, information and belief.

John Stamatakos

Sworn to before me this
14th day of February 2000

Notary Public
My commission expires: 8/24/2001

LUCY F. GUTIERREZ
Notary Public, State of Texas
My Commission Expires 08-24-2001

JOHN STAMATAKOS

Senior Research Scientist
Center for Nuclear Waste Regulatory Analyses
Southwest Research Institute

B.S., Geology, Franklin and Marshall College, Lancaster, Pennsylvania, 1981
M.S., Geology, Lehigh University, Bethlehem, Pennsylvania, 1988
Ph.D., Geology, Lehigh University, Bethlehem, Pennsylvania, 1990

Dr. Stamatakos is a structural geologist and geophysicist with international research experience in regional and global tectonics. Dr. Stamatakos has conducted research on a range of topics including paleomagnetism, neotectonics, kinematics of fault block rotations in strike-slip, normal, and thrust fault systems, effects of internal strain on the magnetic properties of deformed rocks, evolution of curvature in arcuate mountain belts, and age and sequence of deformation in folded and faulted mountain belts. This research has focused on the northern and central Appalachians in the eastern United States and Canada, the Hercynian mountains in Germany and northern Spain, the Rocky Mountains and Basin and Range in the western United States, and the northern Cordilleran Mountains in Alaska. Other strengths include numerical modeling of deformation, magnetostratigraphy, rock magnetism, and exploration geophysics.

As a Research Scientist in the Center for Nuclear Waste Regulatory Analyses, Dr. Stamatakos is a Principal Investigator for structural deformation and seismicity, including tectonics and neotectonics research. Tectonics research at CNWRA currently includes compiling a tectonics Geographic Information System (GIS) database, field analyses of the structural and tectonic elements of the Basin and Range province in southwestern United States, evaluation of seismic and faulting hazards at nuclear facilities, and the development of tectonic models for the region surrounding the proposed high-level nuclear waste repository at Yucca Mountain, Nevada. These investigations, sponsored by the U.S. Nuclear Regulatory Commission, currently support development of the tectonic framework for evaluation of risk of earthquakes and volcanic activity, and the effects of structures and tectonic processes on groundwater flow in the region surrounding Yucca Mountain.

Prior to coming to CNWRA, Dr. Stamatakos held positions as a visiting faculty at the University of Michigan and as a postdoctoral fellow at the Eidgenössische Technische Hochschule (ETH) in Zurich, Switzerland. At the University of Michigan, Dr. Stamatakos taught courses in field mapping, structural geology, geophysics, and tectonics.

Dr. Stamatakos has written or collaborated on nearly 50 papers and reports on structural geology, tectonics, and geophysics. He has made presentations at international conferences in the U.S., Canada, and Europe and has won an outstanding paper award from the American Geophysical Union. Dr. Stamatakos is associate editor of the Geological Society of America Bulletin, GP Editor for EOS of the American Geophysical Union, and is a regular reviewer of papers for the Journal of Geophysical Research, Earth and Planetary Science Letters, Reviews of Geophysics, Journal of Structural Geology, Physics of the Earth and Planetary Sciences, and Geophysical Research Letters as well as grant proposals for the National Science Foundation.

Professional Chronology: Petroleum Geologist, Analex Geosciences, 1981–1983; Research and Teaching Assistant, Lehigh University, 1984–1990; Research Fellow, Eidgenössische Technische Hochschule, Switzerland, 1990–1992, Visiting Assistant Professor, University of Michigan, 1992–1995, Research Scientist, Southwest Research Institute, Center for Nuclear Waste Regulatory Analyses, 1995–Present.

Memberships: Geological Society of America, American Geophysical Union, Sigma Xi.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of	)	
	)	
PRIVATE FUEL STORAGE LLC	)	Docket No. 72-22-ISFSI
	)	
(Independent Spent	)	
Fuel Storage Installation)	)	

CERTIFICATE OF SERVICE

I hereby certify that copies of the "NRC STAFF'S OBJECTIONS AND RESPONSES TO THE "STATE OF UTAH'S SIXTH SET OF DISCOVERY REQUESTS DIRECTED TO THE NRC STAFF (UTAH CONTENTION L)'" in the above captioned proceeding have been served on the following through deposit in the Nuclear Regulatory Commission's internal mail system, or by deposit in the Nuclear Regulatory Commission's internal mail system, with copies by electronic mail, as indicated by an asterisk, or by deposit in the United States mail, first class, as indicated by double asterisk, with copies by electronic mail as indicated, this 14th day of February, 2000.

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