

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

May 18, 1999

¹ Counsel for the State and PFS have agreed that the party responding to Interrogatories and Requests for Admissions during the formal discovery period may timely file a response within eight (8) working days after receipt of the Discovery Request.

"PFS" or "Applicant"). The interrogatories cover all information in the possession, custody and control of PFS and/or its owner members, including information in the possession of officers, employees, agents, servants, representatives, attorneys, or other persons directly or indirectly employed or retained by them, or anyone else acting on their behalf or otherwise subject to their control.

2. Lack of Information. If you currently lack information to answer any Interrogatory completely, please state:

- a. The responsive information currently available;
- b. The responsive information currently unavailable;
- c. Efforts which you intend to make to secure the information currently unavailable; and
- d. When you anticipate receiving the information currently unavailable.

3. Supplemental Responses. Each of the following requests is a continuing one pursuant to 10 C.F.R. § 2.740(e) and the State hereby demands that, in the event that at any later date PFS obtains or discovers any additional information which is responsive to these interrogatories and request for admissions and production of documents, PFS shall supplement its responses to this request promptly and sufficiently in advance of the adjudicatory hearing.

Such supplementation shall include, but not be limited to:

- a. the identity and location of persons having knowledge of discoverable matters;
 - b. the identity of each person expected to be called as an expert witness at any hearing, the subject matter on which she/he is expected to testify, and the substance of her/his testimony; and
 - c. new information which makes any response hereto incorrect.
4. Objections. If you object to or refuse to answer any interrogatory under a claim of privilege, immunity, or for any other reason, please indicate the basis for asserting the objection, privilege, immunity or other reason, the person on whose behalf the objection, privilege, immunity, or other reason is asserted, and describe the factual basis for asserting the objection, privilege, immunity, or other reason in sufficient detail so as to permit the administrative judges in this matter to ascertain the validity of such assertion.

If you withhold any document covered by this request under a claim of privilege, immunity, or for any other reason, please furnish a list identifying each document for which the privilege, immunity, or other reason is asserted, together with the following information: date, author and affiliation, recipient and affiliation, persons to whom copies were furnished and the job title and affiliation of any such persons, the subject matter of the documents, the basis for asserting the privilege,

immunity, or other reason, and the name of the person on whose behalf the privilege, immunity, or other reason is asserted.

5. Estimates. Interrogatories calling for numerical or chronological information shall be deemed, to the extent that precise figures or dates are not known, to call for estimates. In each instance that an estimate is given, it should be identified as such together with the source of information underlying the estimate.

II. DEFINITIONS

Each of the following definitions, unless otherwise indicated, applies to and shall be a part of each interrogatory and request for production which follows:

1. "PFS," "Applicant," "you," and "your" refers to Private Fuel Storage, LLC and the PFS members and their officers, employees, agents, servants, representatives, attorneys, or other persons directly or indirectly employed or retained by them, or anyone else acting on their behalf or otherwise subject to their control.
2. The term "documents" means the originals as well as copies of all written, printed, typed, recorded, graphic, photographic, and sound reproduction matter however produced or reproduced and wherever located, over which you have custody or control or over which you have the ultimate right to custody or control. By way of illustration, but not limited thereto, said term includes:

records, correspondence, telegrams, telexes, wiring instructions, diaries, notes, interoffice and intraoffice communications, minutes of meetings, instructions, reports, demands, memoranda, data, schedules, notices, recordings, analyses, sketches, manuals, brochures, telephone minutes, calendars, accounting ledgers, invoices, charts, working papers, computer tapes, computer printout sheets, information stored in computers or other data storage or processing equipment, microfilm, microfiche, corporate minutes, blueprints, drawings, contracts and any other agreements, rough drafts, and all other writings and papers similar to any of the foregoing, however designated by you. If the document has been prepared and several copies or additional copies have been made that are not identical (or are no longer identical by reason of the subsequent addition of notations or other modifications), each non-identical copy is to be construed as a separate document.

3. "All documents referring or relating to" means all documents that in whole or in part constitute, contain, embody, reflect, identify, state, interpret, discuss, describe, explain, apply to, deal with, evidence, or are in any way pertinent to a given subject.

4. The words "describe" or "identify" shall have the following meanings:

(a) In connection with a person, the words "describe" or "identify" mean to state the name, last known home and business address, last known home and

business telephone number, and last known place of employment and job title;

(b) In connection with a document, the words "describe" or "identify" mean to give a description of each document sufficient to uniquely identify it among all of the documents related to this matter, including, but not limited to, the name of the author of the document, the date, title, caption, or other style by which the document is headed, the name of each person and entity which is a signatory to the document, the date on which the document was prepared, signed, and/or executed, any relevant bates numbers on the document, the person or persons having possession and/or copies thereof, the person or persons to whom the document was sent, all persons who reviewed the document, the substance and nature of the document, the present custodian of the document, and any other information necessary to adequately identify the document;

(c) In connection with an entity other than a natural person (e.g., corporation, partnership, limited partnership, association, institution, etc.), the words "describe" or "identify" mean to state the full name, address and telephone number of the principal place of business of such entity.

(d) In connection with any activity, occurrence, or communication, the words "describe" or "identify" mean to describe the activity, occurrence, or communication, the date of its occurrence, the identify of each person alleged to have had any involvement with or knowledge of the activity, occurrence, or

communication, and the identity of any document recording or documenting such activity, occurrence, or communication.

5. "Date" shall mean the exact day, month, and year, if ascertainable, or if not, the best approximation thereof (including by relationship to other events), and the basis for such approximation.
6. "ER" shall mean the Environmental Report prepared by Private Fuel Storage, LLC as part of its license application for the NRC.
7. "SAR" shall mean the Safety Analysis Report as prepared by Private Fuel Storage, LLC as part of its license application for the NRC.
8. "EIS RAI Response" shall mean PFS's February 18, 1999 response to NRC Staff's December 18, 1998, Request for Additional Information relating to Environmental Impact Statement.
9. "Second Round Safety RAI Response" shall mean PFS's February 10, 1999 response to NRC Staff's January 21, 1999, Request for Additional Information on the License Application.
10. "ISFSI" shall mean the PFS proposed Independent Spent Fuel Storage Installation located in the northwest corner of the Skull Valley Goshute Indian Reservation, Utah.
11. "ITP" or "ITF" shall mean, respectively, the intermodal transfer point or intermodal transfer facility, located next to the Union Pacific mainline

approximately 1.8 miles west of Rowley Junction (also called Timpie) and Skull Valley Road, Utah.

12. The word "discussion" shall mean communication of any kind, including but not limited to, any spoken, written, or signed form of communication.
13. The word "person" shall include any individual, association, corporation, partnership, joint venture, or any other business or legal entity.
14. Words herein of any gender include all other genders, and the singular form of words encompasses the plural.
15. The words "and" and "or" include the conjunctive "and" as well as the disjunctive "or" and the words "and/or."
16. The discovery sought by this request encompasses material contained in, or which might be derived or ascertained from, the personal files of PFS employees, representatives, investigators, and agents.

III. GENERAL DISCOVERY

To the extent that the Applicant has not already answered the general interrogatories and general document requests in the State's first set of discovery requests, please answer the following:

A. GENERAL INTERROGATORIES

Pursuant to agreement between the State and PFS, 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, requests for admissions and requests for the production of documents. Specifically note for which interrogatories, requests for admissions and requests for production 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. To the extent that PFS has not previously produced documents relevant to any Utah admitted contention, identify all such documents not previously produced. PFS may respond to this request by notifying the State that PFS has updated its repository of documents relevant to admitted contentions at Parsons, Behle and Latimer.

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 PFS 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 PFS 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.

B. GENERAL DOCUMENT REQUESTS

The State requests the Applicant to produce the following documents directly or indirectly within its possession, custody or control to the extent not previously produced by the Applicant during informal discovery:

REQUEST NO. 1. All documents in your possession, custody or control that are identified, referred to or used in any way in responding to all of the above general interrogatories and the following interrogatories and requests for admissions relating to specific contentions.

REQUEST NO. 2. To the extent that PFS has not already produced documents to date, all documents in your possession, custody or control relevant to each Utah admitted contention, and to the extent possible, segregated by contention and separated from already produced documents.

REQUEST NO. 3. All documents (including experts' opinions, workpapers, affidavits, and other materials used to render such opinion) supporting or otherwise relating to testimony or evidence that you intend to use at the hearings on each Utah admitted contention.

IV. UTAH CONTENTION E (FINANCIAL ASSURANCE)

A. REQUESTS FOR ADMISSIONS – Utah Contention E

REQUEST FOR ADMISSION NO. 1. Reference the notes of the PFS Board of Members meeting of June 23, 1998, PFS bates number 29338 (see PFS File No. 182.1 entitled General). Do you admit that PFS received the required minimum commitment from LLC members by the time of the September 15, 1998 submission to the NRC.

REQUEST FOR ADMISSION NO. 2.

[REDACTED - PROPRIETARY INFORMATION]²

REQUEST FOR ADMISSION NO. 3. Do you admit that the minimum tonnage commitment to make the proposed facility financially feasible is 15,000 MTU. See LA 1-5.

REQUEST FOR ADMISSION NO. 4. Do you admit that new utilities have joined as members of PFS LLC since the June 23, 1998 PFS Board of Members meeting.

REQUEST FOR ADMISSION NO. 5. Reference PFS document bates number 03086, marked by PFS as confidential (see PFS File No. 040.1 entitled Contention 13 - Utah S/Castle Rock 7).

[REDACTED - PROPRIETARY INFORMATION]

REQUEST FOR ADMISSION NO. 6. Do you admit that the PFS Board of Managers has formally committed to the Low rail corridor as the primary transportation route to be employed for transporting casks to the PFS ISFSI site.

B. DOCUMENT REQUESTS - Utah Contention E

DOCUMENT REQUEST NO. 1. Reference the notes of the PFS Board of Managers meeting of June 23, 1998, PFS bates number 29338 (see Admission Request No. 1). Provide copies of the documentation related to the

² Please refer to the explanation regarding the withholding of PFS proprietary information on page 22 of the State's First Set of Discovery Requests Directed to the Applicant, dated April 9, 1999.

[REDACTED - PROPRIETARY INFORMATION]

DOCUMENT REQUEST NO. 2. Provide documents relating to the potential interest of non-member utilities to participate as owners of PFSLLC or to store SNF at the PFS facility.

DOCUMENT REQUEST NO. 3. Please provide all documents that deal with the cost of moving the SNF stored at the proposed ISFSI to another location at the end of the license period.

DOCUMENT REQUEST NO. 4. Please provide copies of all engineering plans, schedules, and costs which quantify the initial capital cost of constructing the facility and which form the basis for the conclusion in the ER at 8.2-21 that there would "[a] high initial capital cost to construct a facility to store all the fuel prior to storage..."

DOCUMENT REQUEST NO. 5. A document entitled "Board Book, Confidential Material" was provided beginning at PFS number 07437 (from PFS File

No. 061.1 entitled Contention 3 - Utah E/Castle Rock 7/Confederated Tribes F).

Provide copies of all other such "Board Books" provided to PFS participating utilities and/or members of the PFS Board of Managers.

DOCUMENT REQUEST NO. 6. Reference PFS Bates number 07911 in the January 1997 Revision of the PFS Business Plan (see PFS document beginning at bates number 07892, marked by PFS as confidential, from PFS File No.061.1 entitled Contention 3 - Utah E/Castle Rock 7/Confederated Tribes F).

[REDACTED - PROPRIETARY INFORMATION]

DOCUMENT REQUEST NO. 7. Reference PFS Bates numbers 07914-5 in the January 1997 Revision of the PFS Business Plan (see Document Request No. 6 above). Provide copies of the unredacted versions of these pages.

DOCUMENT REQUEST NO. 8. Reference PFS document bates numbers 9094-9099 (from PFS File No. 089.1 entitled Contention 18 - Utah Z). Provide copies of all assessments of U.S. utility in-pool SNF storage capability that have been prepared by or for PFS since March 1998.

DOCUMENT REQUEST NO. 9. The document provided at PFS bates number 00554 (see PFS File No. 027.1 entitled General) appears to be the notes of a weekly progress report by SWEC. To the extent not already provided, please provide copies of all other correspondence and notes of telephone conversations which relate to any other SWEC weekly progress reports.

DOCUMENT REQUEST NO. 10. The document provided at PFS bates number 24893 (see PFS File No. 125.1, entitled Contention 13, Utah S) appears to be the notes of an SWEC telephone conversation related to the PFS project. To the extent not already provided, please provide copies of all other notes of SWEC telephone conversations that relate to the PFS project.

DOCUMENT REQUEST NO. 11. Reference PFS document bates number 9417 (see PFS File No. 097.2 entitled General). To the extent not already provided, please provide copies of all other Stone & Webster Engineering Corporation Progress Reports.

DOCUMENT REQUEST NO. 12. The PFS document bates numbered 10370 (see PFS File No. 061.2 entitled Contention 3 - Utah E/Castle Rock7/Confederated Tribe F) is a Private Fuel Storage LLC Report, dated July 1998. Provide copies of all such Private Fuel Storage LLC Reports that have been issued since July 1998.

DOCUMENT REQUEST NO. 13. To the extent not already provided, please provide copies of the notes, summaries, and minutes of all meetings of the PFS Board of Managers that have been held since January 1, 1998, that have not already been provided.

DOCUMENT REQUEST NO. 14. Please provide documents discussing, setting forth, or dealing with in any way with the cost or estimated cost of construction and/or operation of other existing or proposed on-site or off-site ISFSIs.

DOCUMENT REQUEST NO. 15. Please provide all documents discussing, setting forth, or dealing in any way with the estimated cost of constructing and/or operating the ISFSI that was proposed for the Mescalero site in New Mexico.

DOCUMENT REQUEST NO. 16. Please provide a copy of all documents including notes and workpapers dealing with the current estimated cost of constructing the proposed PFS ISFSI.

V. UTAH CONTENTION L (GEOTECHNICAL)

A. REQUESTS FOR ADMISSIONS – Utah Contention L

REQUEST FOR ADMISSION NO. 1: Do you admit that the use of the Cone Penetrometer Test (CPT) is state-of-practice in geotechnical engineering for defining thin layers and layer boundaries and that its application would better define and characterize the stratigraphy in the upper profile at the PFS site than PFS's use of drilling and split-spoon sampling at five-foot intervals.

REQUEST FOR ADMISSION NO. 2: Do you admit that the state-of-practice in earthquake geotechnical engineering is to determine primary and shear wave velocity values from results obtained from cross-hole or down-hole techniques?

REQUEST FOR ADMISSION NO. 3: Do you admit that shear wave velocity profiles determined from seismic refraction surveys are less definitive in identifying key layer properties than results obtained from cross-hole or down-hole

techniques?

REQUEST FOR ADMISSION NO. 4: Do you admit that the depth to bedrock is a significant input parameter in performing ground motion modeling studies?

REQUEST FOR ADMISSION NO. 5: Do you admit that the depth to bedrock in the SAR is imprecise for performing ground motion modeling studies?

REQUEST FOR ADMISSION NO. 6: Do you admit that the undrained shear strength is an important input parameter for geotechnical design and that the value of undrained shear strength used for the PSF design calculations for the silty-clay/clay silt in the upper soil profile was obtained from only two laboratory tests for an approximate 150-acre facility?

REQUEST FOR ADMISSION NOS. 7-8: Requests for Admissions Nos. 8-9 are based on Stone & Webster Calculation 05996.01-G(B)-03-1, *Estimate Static Settlement of Storage Pads* (May 13, 1997), which attributes unexpectedly large values of $C\alpha$ (i.e., coefficient of secondary consolidation) to the effects of "sample disturbance."

REQUEST FOR ADMISSION NO. 7. Do you admit that sample disturbance has occurred?

REQUEST FOR ADMISSION NO. 8. Do you admit that when sample disturbance occurs, the geotechnical properties (e.g., shear strength and consolidation) derived from the field and laboratory test program may bias the results

and the calculations?

REQUEST FOR ADMISSIONS NO. 9 -10. Requests for Admissions Nos. 10-

11 are based on the following:

Review of the Applicant's two tests in the Geotechnical Report, SAR, App. 2A shows that a confining stress of 1.3 ksf was used for both tests. This corresponds to depth and overburden of approximately 16 feet:

$$\text{Moist unit weight} = \text{dry unit weight} \times (1 + \text{moisture content}/100)$$

$$\text{For these samples dry unit weight} = (67 \text{ pcf} + 58 \text{ pcf})/2 = 62.5 \text{ pcf}$$

$$\text{Moisture content} = (27.4 \% + 35.6\%) / 2 = 31.5 \text{ percent}$$

$$\text{Moist unit weight} = 62.5 \text{ pcf} (1 + 0.315) = 82.2 \text{ pcf}$$

$$\text{Depth of overburden equivalent to 1.3 ksf} = 1300 \text{ psf} / 82.2 \text{ pcf} = 15.8 \text{ feet.}$$

A confining stress in the laboratory of 1.3 ksf corresponds to a depth of about 16 feet.

However, the samples were taken from depths of 10.4 feet and 11.1 feet. Thus, these samples were tested in the laboratory at a higher confining stress (i.e., cell pressure)

than what is present in situ. Because the laboratory determined undrained shear

strength is dependent on the cell pressure for unsaturated soils (see ASTM 2580), the

results from these two tests will overestimate the true in situ strength. ASTM-2850

Section 4.3 states, "If the test specimens are partially saturated or compacted specimens,

where the degree of saturation is less than 100 %, consolidation may occur when the

confining pressure is applied and during shear, even though drainage is not permitted.

Therefore, if several partially saturated specimens of the same material are tested at different confining stresses, they will not have the same undrained shear strength."

REQUEST FOR ADMISSION NO. 9: Do you admit that the undrained shear strength of a partially saturated soil is dependent upon the applied confining stress as stated by ASTM-2850 Section 4.3 (see quote above)?

REQUEST FOR ADMISSION NO. 10: Do you admit that the undrained shear strength reported in the Geotechnical Laboratory Report, SAR, App. 2A, Att. 2 may be unconservative from an engineering perspective, due to consolidation during testing and due to applying a confining stress that is too high for the depth from which the sample was taken (see calculation and discussion above)?

REQUEST FOR ADMISSION NO. 11: Do you admit that split-spoon sampling is a form of disturbed sampling and is of little value in gaining samples for laboratory tests for undrained shear strength, consolidation properties, or collapse properties of fine-grained soils?

REQUEST FOR ADMISSION NO. 12: Do you admit that the majority (i.e., greater than 80 percent) of the sampling done in the upper 30 to 35 feet in a "silt, clayey silt and silty clay" layer was done with split-spoon sampling, and hence has little value in determining undrained shear strength and consolidation properties?

REQUEST FOR ADMISSION NO. 13: Do you admit that an applied load of 0.5 tsf was used for some samples inundated with distilled water during

consolidation testing and that this applied constant load during wetting under-
represents the actual foundation loads at the PFS ISFSI site?

REQUEST FOR ADMISSION NO. 14: Do you admit that textbook values
of C_{α} were used in settlement calculations instead of those values obtained from the
field laboratory test program?

REQUEST FOR ADMISSION NO. 15: Do you admit that inputted C_{α}
textbook values may underestimate the actual settlement because they are smaller than
the values obtained from the field and laboratory program?

REQUEST FOR ADMISSION NO. 16: Do you admit that the apparent
preconsolidation of the Bonneville Deposits (i.e., upper 30 feet of the profile) is due to
dessication, cementation, and aging, and not to preloading?

REQUEST FOR ADMISSION NO. 17: Do you admit that the
preconsolidation profile may be somewhat erratic with depth and cannot be
characterized by a single value?

REQUEST FOR ADMISSION NO. 18: Do you admit that estimates of
Poisson's ratio used in Stone & Webster Calculation 05996.01-G(B)-01-1, page 17 are
typical values from textbooks and/or empirical correlations and are not values
obtained from site-specific studies?

REQUEST FOR ADMISSION NO. 19: Do you admit that the geotechnical
report ,SAR, App. 2A, Att. A, describes the soils in the upper profile (i.e.,

approximately 30 feet) as predominately cohesive?

REQUEST FOR ADMISSION NO. 20: Do you admit that Stone & Webster Calculation 05996.01-G(B)-01-1, page 24 inappropriately uses equations for determining the modulus of subgrade reaction (k) for cohesionless soils when the site-specific soils are predominately cohesive soils?

REQUEST FOR ADMISSION NO. 21: Do you admit that Stone & Webster calculation 05996.01-G(B)-04-1, *Stability Analyses of Storage Pads* (May 8, 1997) at 13 uses the full value of the undrained shear strength of 2,200 psf to determine the footing sliding resistance?

REQUEST FOR ADMISSION NO. 23: Do you admit that standard geotechnical practice is to use an adhesion factor (C_a), which is some fraction of the undrained shear strength?

REQUEST FOR ADMISSION NO. 24: Do you admit that the use of 2,200 psf shear strength to determine the footing sliding resistance leads to an unconservative estimate of the potential sliding resistance?

B. INTERROGATORIES - Utah Contention L

INTERROGATORY NO. 4. There are a small number of geotechnical borings shown in SAR Fig. 2.6-2; the borings are on approximately 750-foot spacing center-to-center; sampling is on 5-foot intervals; there are no borings under the canister transfer building and other site buildings (e.g., security and health physics, operations,

administration, etc.); and only one geotechnical boring is located under the southeast fuel storage area. Taking into account this sparse sampling program, explain how the Applicant has adequately identified and accounted for potential variation (i.e., horizontal and vertical) in soil layering and engineering properties in the foundation assessment and design. The explanation should include a description of how critical layers were properly and adequately identified, sampled, and analyzed for foundation design and dynamic modeling purposes.

INTERROGATORY NO. 5. Describe and quantify the uncertainties associated with elastic properties (e.g., shear, Young's, constrained, and bulk moduli and Poisson's ratio) determined indirectly from seismic refraction surveys, empirical correlations, and textbook values and how those uncertainties were conservatively accounted for and incorporated into the ground motion modeling studies and seismic design of the foundations.

INTERROGATORY NO. 6. The Geotechnical Laboratory Report, SAR App2A, Att. 2, states: "we were concerned that the large amount of secondary consolidation may be due to the inundation of the samples with distilled water." Explain why the Applicant did not further investigate the "large amount of secondary consolidation" due to inundation of the samples and explain how the Applicant properly assessed and addressed collapse potential in the geotechnical calculations given that the approximate 3 to 5 percent strain, under constant load after wetting the

sample, as shown in some of the consolidation tests, is evidence for a moderately collapsible soil.

INTERROGATORY NO. 7: The Geomatrix Fault Assessment Report suggests that ground rupture/faulting has occurred within the boundaries of the facility. Describe why the effects of ground rupture and its consequences have not been assessed for the foundation systems, especially for the canister transfer building and the cask storage pads.

INTERROGATORY NO. 8: Explain the reason for different time histories being used to represent the strong ground motion for the seismic design of the various facilities by the various PSF consultants (e.g., Stone & Webster, Holtec, etc.) and explain why a consistent set of time histories has not been applied to all facilities for the seismic design.

INTERROGATORY NO. 9: To generate acceleration time histories, it is required to show that spectrum matching requirements are satisfied at all applicable damping values. Explain why the Applicant did not use other values of damping for the design and analysis of the foundations for the casks and transfer building given that the acceleration-compatible time histories are shown to match the design response spectra only at 5% damping.

INTERROGATORY NO. 10: Recent near-fault recordings of the ground motion from Kobe, Japan and Northridge, California earthquakes show significant

"fling" in the time histories. Such strong velocity pulses are currently maintained in design of near-fault facilities. Describe what measures, if any, have been taken to ensure that the "fling" due to proximity of the faults at the PSF site have been maintained in the time histories used for seismic design of the foundations?

INTERROGATORY NO. 11: The geology and geometry of Skull Valley warrant the consideration of basin effects in determining strong ground motion for seismic design. Recent Northridge earthquake data and ongoing USGS research indicate that a significant amplification and increase in duration of ground motion could occur due to basin effects. Describe how basin effects were considered in the development of design time histories for the seismic design of the foundations of the canister transfer building and the cask storage pads.

INTERROGATORY NO. 12: In developing design response spectra, both the deep soil and rock attenuation relationships have been used and the results have been enveloped. However, geophysical data from the site shows that the site is covered with a low velocity layer (shear wave velocity of about 750 feet/second) in the upper 30 feet, which overlies a much stiffer layer (shear wave velocity of about 2100 feet/second). Recent earthquake data has shown that a significant application of motion can take place due to the presence of shallow soil deposits (i.e., less than 100 feet). Describe how the attenuation relations used in developing the design response spectra are directly applicable to this site, and explain how the potential for soil

amplification has been accounted for in the seismic design of the foundation systems.

INTERROGATORY NO. 13: The control point for design motion has been specified at ground surface level in the seismic analysis and design of the foundations of the facility. NRC SRP 3.7.2 states that "for profiles consisting of one or more thin soil layers overlaying competent material, the control motion should be located at an outcrop (real or hypothetical) at the top of the competent material in the vicinity of the site." Explain why the recommendation of the SRP 3.7.2 has not been used for the seismic design of the foundations.

C. DOCUMENT REQUESTS - Utah Contention I

DOCUMENT REQUEST NO. 1. In addition to Fig. 2.6-5 in the SAR, which is inadequate for geotechnical design, especially for the soil layer boundaries which are not readily apparent and are dashed with a question mark, provide documents relating to the final design cross-sections used for engineering analysis and the engineering properties (e.g., index, shear strength, preconsolidation stress, compressibility, etc. associated with each layer.)

DOCUMENT REQUEST NO. 2: Provide profile lines in addition to the profile line A-A' in SAR Fig. 2.6-5, which will allow one to understand the spatial variability of layer thickness and depths across the site for the geotechnical investigations.

DOCUMENT REQUEST NO. 3: Please produce all documents,

calculations, reports and data that show how the geotechnical and dynamic design properties below 100 feet were estimated and also show the uncertainties associated with these estimates.

DOCUMENT REQUEST NO. 4: Please produce all documents, calculations, reports and data that discuss how the design shear wave velocity profiles shown in SAR Figure 2.6-13 have been determined and that these values have been consistently applied in all subsequent dynamic modeling cases.

DOCUMENT REQUEST NO. 5: Provide all documents relating to the geotechnical investigation that demonstrate that the sampling and handling procedures meet the requirements for Nuclear Quality Assurance Class 1. This should include, but not be limited to, drilling procedures, sample preparation, handling and storage procedures and laboratory procedures as well as objective evidence to support that these procedures were implemented (e.g., preapprovals, QA surveillances, chain-of-custody, etc.).

DOCUMENT REQUEST NO. 6: Provide documentation for the basis of selecting which undisturbed samples (Shelby Tubes) were tested for shear strength and consolidation properties.

DOCUMENT REQUEST NO. 7: If the soil has a "weak structure," as described in the geotechnical laboratory report, provide documents that describe what extra precautions were taken to prevent disturbance while extruding the samples for

the UU and consolidation tests.

DOCUMENT REQUEST NO. 8: Provide documentation of all calculations which used the undrained shear strength value of 2.2 ksf as a basis for design.

DOCUMENT REQUEST NO. 9: Provide all documents and technical literature justifying the conclusion that ASTM-2850 will give the same undrained shear strength as ASTM D-2166 for a partially saturated soil.

DOCUMENT REQUEST NO. 10: Provide documentation of how the five "undisturbed" samples submitted for consolidation tests were selected and how these samples are representative of an approximate 150-acre site.

DOCUMENT REQUEST NO. 11: Provide documentation of how potential variability in the consolidation properties was accounted for in the settlement calculations for the facilities.

DOCUMENT REQUEST NO. 12: NRC SRP 3.7.1 requires generation of compatible target power spectrum density functions (PSDF). Provide documentation, including but not limited to calculations and equations, of how the compatible target PSDFs were computed for the facilities. Also, provide documentation of how the matching requirements of SRP 3.7.1 were followed from 0.3 Hz to 24 Hz and the units used in the PSDF plots.

DOCUMENT REQUEST NO. 13: Provide documents, including but not limited to calculations, to demonstrate that the developed time histories of motion

have no drift in the motion for the velocity and displacement time histories.

DOCUMENT REQUEST NO. 14: Provide all documentation regarding the depth to groundwater and the depth of ground water assumed in engineering calculations for design of the foundation systems.

DOCUMENT REQUEST NO. 15: Provide all documentation regarding seasonal variations in groundwater and how these seasonal variations were conservatively used in calculations involving use of effective vertical stress values and variations of Poisson's ratio with depth.

DOCUMENT REQUEST NO. 16: Provide all documentation regarding the groundwater gradient, or the piezometric surface, at the site that was used in geotechnical and hydrogeological modeling.

DOCUMENT REQUEST NO. 17: Provide all documentation regarding the existence or non-existence of artesian conditions at the site. The SAR is inconclusive about confined conditions and uses sparse data for locations that are some distance (3 to 6 miles) away from the facility.

DOCUMENT REQUEST NO. 18: Geomatrix Consultants, Inc. Calculation 05996.01G(PO5)-1, *Development of soil and foundation parameters in support of dynamic soil-structure interaction analyses* (June 9, 1997), page 7 states: "The maximum past pressure experienced by the uppermost silty clayey layer was about 6000 psf. It is assumed that this maximum pressure was caused by approximately of an additional

[sic] 80 feet of soils above the current ground surface." Provide all documents relating to the basis and evidence for the assumption that the soils have been overconsolidated by preloading (i.e., overburden soils), which have been subsequently removed.

DOCUMENT REQUEST NO. 19: Provide all documents relating to the basis for the properties shown in Section 2.6.1.11 of the SAR and how they vary with depth, including the boring, depth, soil classification and index properties, as well as the total number of observations of each type of test and a plot of the total number of observations versus depth.

DOCUMENT REQUEST NO. 20: Provide all laboratory testing that substantiates the statement: "There is no evidence of soluble mineral deposits in the unconsolidated materials beneath the site . . ." (SAR at 2.6-37) and any testing performed for soluble salts.

DOCUMENT REQUEST NO. 21: The SAR App. 2A Geotechnical Data Report, Att. 1 Geotechnical Laboratory Testing, page 2 states: "The soil tested is moderately to highly plastic, clayey silt, partially saturated. It appears to be alkaline since the conductivity of the distilled water inundating the samples as high (over 18,000 umho). Also, the soil reacts immediately to a 10% solution of hydrochloric acid." Provide all documents that further elaborate on or describe this testing.

DOCUMENT REQUEST NO. 22: Provide all design drawings and calculations regarding the retention basin and the lining for the basin.

DOCUMENT REQUEST NO. 23: Provide excavation elevations for all foundations.

DOCUMENT REQUEST NO. 24: Provide a list of those calculations which used a modulus of subgrade reaction determined from equations for cohesionless soils.

DOCUMENT REQUEST NO. 25: Provide all documents, including data/calculations supporting the use of the shear modulus reduction and damping ratio curves from Vucetic and Dobry (1991), referred to in Geomatrix Calculation 05996.01-G(P05)-1, Rev. 0, *Development of Soil and Foundation Parameters in Support of Dynamic SSI Analysis* (March 31, 1997) at 7).

DOCUMENT REQUEST NO. 26: Provide a list of all calculations that used the full undrained shear strength value to determine sliding resistance.

VI. UTAH CONTENTION S (DECOMMISSIONING)

A. REQUESTS FOR ADMISSIONS - Utah Contention S

REQUEST FOR ADMISSION NO. 1. Do you admit that the economic life of the proposed PFS facility depends upon whether and when the SNF stored at PFS can be transferred to a permanent storage facility.

REQUEST FOR ADMISSION NO. 2. Do you admit that the cost of decommissioning the site depends on the peak tonnage of fuel stored at the site.

REQUEST FOR ADMISSION NO. 3. Do you admit that the peak volume of

SNF which may be stored at the site is unknown and estimates of peak volume vary widely.

REQUEST FOR ADMISSION NO. 4. Page 2-1 of LA Appendix B states:

"Actual decontamination efforts and sequences will depend on facility operating history and whether any contamination actually exists." Do you admit that, depending on the operating history, including the number of casks stored, the occurrence or non-occurrence of different types of accidents and natural events, the cost estimates presented in LA Appendix B may be underestimated by a wide margin.

REQUEST FOR ADMISSION NO. 5. License Application, Appendix B on page 4-2 (lines 3-4) state: "It is therefore anticipated that the storage casks will have no radioactive contamination or activation." Do you admit that the "less than \$17,000" cost estimate presented to decommission a storage cask is not based on any empirical or probabilistic analysis. See Id. at 4-2.

REQUEST FOR ADMISSION NO. 6. Reference page 4-2 of LA Appendix B. Do you admit that the assumption that the "maximum portion of a cask liner which could have residual activation or contamination is 20%" has no empirical basis.

REQUEST FOR ADMISSION NO. 7. Do you admit that PFS has done no analysis of the impact on decommissioning and/or decontamination costs of a major accident or natural occurrence.

**[REQUESTS FOR ADMISSIONS NOS. 8-17
ARE REDACTED - PROPRIETARY INFORMATION]**

REQUEST FOR ADMISSION NO. 18. Reference the May 20, 1997

Amended and restated Business Lease between the Skull Valley Band of Goshute Indians and PFS, section 7(A). Do you admit that Section 7(A) of the lease obligates PFS to remove storage pads at its own expense at the option of the tribe.

B. DOCUMENT REQUESTS - Utah Contention S

DOCUMENT REQUEST NO. 1. Reference PFS Bates number 07908 in the January 1997 Revision of the PFS Business Plan (see PFS document beginning at bates number 07892, marked by PFS as confidential, from PFS File No.061.1 entitled Contention 3 - Utah E/Castle Rock 7/Confederated Tribes F). Provide copies of the analyses, assessments, evaluations, studies and reports of the costs of decommissioning the storage overpacks at PFS at the end of the facility's operating life.

DOCUMENT REQUEST NO. 2. Reference PFS Bates number 07908 in the January 1997 Revision of the PFS Business Plan (see Document Request No. 1 above). Provide copies of the plans and procedures for decommissioning the storage overpacks at PFS at the end of the facility's operating life.

DOCUMENT REQUEST NO. 3. LA Appendix B at 4-2, ¶ 1, lines 3-4 states: "It is therefore anticipated that the storage casks will have no radioactive contamination or activation." Please provide the documentary support relied on for this assertion.

DOCUMENT REQUEST NO. 4. Please provide any documentary support for the statement: "Assuming the maximum portion of a storage cask liner which

could have residual activation or contamination is 20% . . ." See LA Appendix B at 4-2.

DOCUMENT REQUEST NO. 5. Please provide all documents describing industry experience with the type of cask liner described in ¶2 of page 4-2 of LA Appendix B.

DOCUMENT REQUEST NO. 6. Please provide all documents containing any sensitivity analysis of the impact of changes or errors in the estimates and assumptions used in PFS's Decommissioning Plan. See LA Appendix Bat 4-2 to 4-4.

DOCUMENT REQUEST NO. 7. Reference LA Appendix B at 4-2 (top paragraph), which states:

In order to conservatively account for the unlikely event that a storage cask is found to have contamination or activation levels above the applicable NRC limits for unrestricted release, an estimate has been made of the costs to decontaminate and dispose of a storage cask.

Please provide all documentary support for the claims that (a) PFS's analysis is conservative; (b) contamination or activation is unlikely; and (c) PFS's cost estimate is reasonable.

DOCUMENT REQUEST NO. 8. Reference LA Appendix B at 4-3 and 4-4, which states: "The concrete storage pads will only be used for sealed storage casks and it is not anticipated that they will become activated or contaminated. The only mechanism which could result in contamination of a storage pad is by having a contaminated canister which was not detected prior to insertion in a storage cask. The

possibility of such an occurrence is remote, but is addressed for decommissioning purposes by assuming up to 10 percent of the storage pad area will require surface decontamination. The maximum number of storage pads is 500, . . . for a total area of 960,000 square feet." Please provide documentation showing:

- a. Pads could not be contaminated through serious accident or natural occurrence after being placed on the pads;
- b. The calculation showing that the "possibility of such an occurrence is remote";
- c. That the assumption of "up to 10 percent" is reasonable and has an empirical basis;
- d. The basis for the assertion that the maximum number of storage pads is 500; and
- e. The assumptions underlying the basis of the 500 pad figures with respect to the timing of the inflow and outflow of SNF; the tonnage of SNF that will be handled; and the years of operation of the facility.

DOCUMENT REQUEST NO. 9. Reference LA Appendix B at 4-2, which states that: "The total cost to decommission a storage cask is estimated to be less than \$17,000." Please provide documentation of the number of storage casks that will be subject to decommissioning and disposal by the end of the term of the license.

DOCUMENT REQUEST NO. 10. If no permanent disposal site is available

and able to take SNF during the term of the license applied for here, please provide documentation of the maximum number of storage casks that would need to be decommissioned and disposed of. See LA Appendix B at 4-2.

DOCUMENT REQUEST NO. 11. Please provide documents dealing in any way with the liability for storage cask decontamination and disposal costs in the event that such costs exceed PFS's \$17,000 per canister estimate. See LA Appendix B at 5-1.

DOCUMENT REQUEST NO. 12. Please provide any documents which explain the necessity for prepayment of the full cost of storage cask decommissioning. See LA Appendix B at 5-1.

DOCUMENT REQUEST NO. 13. Please provide documentation of your assertion that a letter of credit in the amount of \$1,631,000 will be adequate to decommission the site (exclusive of storage casks). See LA Appendix B at 5-2.

DOCUMENT REQUEST NO. 14. Please provide documentation showing the probability that site decommissioning can be accomplished for no more than \$1,631,000 (exclusive of storage casks). See LA Appendix B at 5-2.

DOCUMENT REQUEST NO. 15. Please provide documentation showing whether PFS will have additional funds or insurance available at the time of site decommissioning to ensure that funding will be adequate in the event that the PFS estimate of \$1,631,000 is too low. See LA Appendix B at 5-2.

DOCUMENT REQUEST NO. 16. With respect to LA Appendix B at 6-2,

where it states, "Under normal conditions of canister transfer and storage operations, the potential does not exist for contaminating the storage casks," please provide documentation showing what the potential is for contamination of storage casks when "normal conditions" do not obtain.

VII. UTAH CONTENTION Z (NO ACTION ALTERNATIVE)

DOCUMENT REQUESTS - Utah Contention Z

DOCUMENT REQUEST NO. 1. Provide copies of the analyses, assessments, evaluations, reports and studies which examine or quantify utilities' need for additional off-site SNF capacity. See ER at 1.2-1.

DOCUMENT REQUEST NO. 2. Provide copies of all analyses, assessments and evaluations prepared by or for PFS (a) that assume that DOE will begin accepting SNF prior to the year 2015, or (b) that assume that DOE will not begin accepting SNF until after the year 2015.

DOCUMENT REQUEST NO. 3. Provide copies of any analyses and assessments of at-reactor SNF storage costs that assume that the PFS facility will not be open to receive SNF until after the year 2002.

DOCUMENT REQUEST NO. 4. Provide copies of the analyses, assessments, evaluations, studies, and reports related to PFS's evaluation of the "No Build Alternative." See ER at 8.1-2.

DOCUMENT REQUEST NO. 5. Provide copies of the analyses, assessments, evaluations, studies, and reports which form the basis for the conclusion that not building the PFSF "will increase the risk of early shutdown of operating reactors." See ER at 8.1-4.

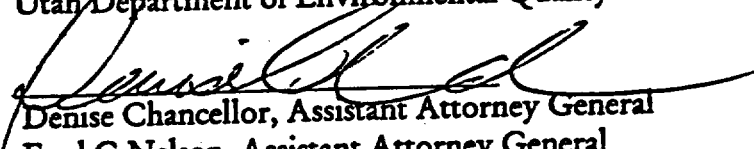
DOCUMENT REQUEST NO. 6. Provide copies of the analyses, assessments, evaluations, studies, and reports which form the basis for the conclusion that not building the PFSF "will reduce the likelihood of life extension." See ER at 8.1-4.

DATED this 18th day of May, 1999.

Respectfully submitted,

STATE OF UTAH

By _____
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DATED this 18th day of May, 1999.

Respectfully submitted,

STATE OF UTAH

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CERTIFICATE OF SERVICE

I hereby certify that a copy of STATE OF UTAH'S THIRD SET OF
DISCOVERY REQUESTS DIRECTED TO THE APPLICANT [*Redacted Version*]
was served on the persons listed below by electronic mail (unless otherwise noted) with
conforming copies by United States mail first class, this 18th day of May, 1999:

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