June 28, 1999

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
	)	
(Private Fuel Storage Facility)	)	ASLBP No. 97-732-02-ISFSI

APPLICANT'S OBJECTIONS AND NON-PRORIETARY RESPONSES TO STATE'S THIRD REQUESTS FOR DISCOVERY

Applicant Private Fuel Storage L.L.C. ("Applicant" or "PFS") files the following objections and responses to "State of Utah's Third Set of Discovery Requests Directed to the Applicant" ("State's Third Discovery Requests"), an electronic copy of which was served on the Applicant on Tuesday, May 18, 1999. The Applicant is filing responses to the discovery requests for the Group II and Group III contentions, in accordance with the Board's Order dated June 17, 1999, granting extension for such filing to on or before June 28, 1999.[1]

I. GENERAL OBJECTIONS

These general objections apply to the Applicant's responses to all of the State's Third Discovery Requests.

[1] The following Group II and Group III contentions set forth in the State's Third Discovery Requests are addressed in this Response: the requests set forth with respect to Utah L and the requests set forth with respect to Utah Z. The responses to the State's Third Discovery Requests for Utah Contentions E and S are being filed in a separate proprietary response.

1. The Applicant objects to State's instructions and definitions on the grounds and to the extent that they request or purport to impose upon the Applicant any obligation to respond in manner or scope beyond the requirements set forth in 10 C.F.R. §§ 2.740, 2.741 and 2.742.

2. The Applicant objects to State's Request for Production of Documents to the extent that it requests discovery of information or documents protected under the attorney-client privilege, the attorney work product doctrine, and limitations on discovery of trial preparation materials and experts' knowledge or opinions set forth in 10 C.F.R. § 2.740 or other protection provided by law. The Applicant has provided the State with a Privilege Log which identifies documents subject to these privileges and protections, which the Applicant reserves the right to supplement.[2]

3. The Applicant objects to the State's interrogatories and document requests to the extent they seek discovery beyond the scope of the Utah contentions, as admitted by the Board in this proceeding. The State is only permitted to obtain discovery on matters that pertain to the subject matter with which the State is involved in this proceeding. 10 C.F.R. § 2.740(b).

[2] PFS has with respect to some of the specific requests objected on grounds of privilege. The specific mention of privilege in some of the objections does not mean that there are no documents on which PFS claims privilege with respect to documents for which a privilege objection is not specifically raised. The Privilege Log identifies those documents on which PFS claims privilege, which Log PFS will be updating upon completing its update of documents relevant to admitted contentions maintained at Parsons Behle and Latimer in Salt Lake City. See Response to General Interrogatory No. 2 and General Document Request No. 2.

II. GENERAL DISCOVERY REQUESTS

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 C.F.R. § 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.

APPLICANT'S RESPONSE: In addition to counsel for PFS, the following persons were consulted and/or supplied information in responding to the discovery requests for the contentions in the State's Third Discovery Requests:

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Utah Contention L

In response to whether the information or opinions of anyone who was consulted in connection with PFS's response to an interrogatory or request for admission differs from the PFS's written answer to the discovery request, PFS is unaware of any such difference among those consulted.

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.

APPLICANT'S RESPONSE: As jointly agreed to by the State and PFS, PFS will notify the State upon updating its repository of documents relevant to admitted Contentions maintained at Parsons Behle and Latimer in Salt Lake City.

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.

APPLICANT'S RESPONSE: The Applicant has not identified any additional persons whom it expects to call as witnesses at the hearing with respect to the State's admitted contentions beyond those identified in the Applicant's Response to the State's First Set of Discovery Requests. See Response to State's First Set of Discovery Requests, General Interrogatory No. 3 as supplemented. The Applicant will supplement this response in accordance with 10 C.F.R. § 2.740(e) as it obtains further information.

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.

APPLICANT'S RESPONSE: See Response to General Interrogatory 3 above.

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.

APPLICANT'S RESPONSE: See Response to General Interrogatory 3 above.

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.

APPLICANT'S RESPONSE: To the extent PFS has not previously produced such documents, PFS will forward them to its repository of documents maintained at Parsons Behle and Latimer in Salt Lake City, Utah.

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.

APPLICANT'S RESPONSE: PFS will update its repository of documents relevant to admitted contentions maintained at Parsons Behle and Latimer in Salt Lake City, as jointly agreed to by the State and PFS. PFS will notify the State upon updating its repository of documents maintained at Parsons Behle and Latimer. See Response to General Interrogatory No. 2.

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.

APPLICANT'S RESPONSE: Applicant objects to this Request as being overly broad, vague, unduly burdensome and seeking privileged material. Applicant will provide such documents, with respect to its witnesses/experts, as agreed to by the State and PFS. See Applicant's Objections and Non-Proprietary Responses to State's First Requests for Discovery, Response to General Interrogatory No. 5 (Apr. 21, 1999).

III. UTAH CONTENTION L (Geotechnical)

A. REQUEST 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.

APPLICANT'S RESPONSE: Admitted. PFS has recently completed a cone penetration testing program. The results of this program were attached and submitted to the NRC via PFS letter, Donnell to Delligatti, Submittal of Commitment Resolution No.4 Information, dated 5/28/99. This program obtained additional subsurface data in the form of continuous profiles of tip resistance and sleeve friction resistance in a grid pattern of ~300 ft, supplementing the available database of subsurface information. The profiles of strength and compressibility included in the report of the cone penetration testing (ConeTec, 1999) demonstrate that the underlying soils are stronger and less compressible than those at the shallower depth. Therefore, the analyses of the stability and settlements

of the cask storage pads based on the results of laboratory tests that were performed at depths of ~10 to 12 ft are conservative.

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?

APPLICANT'S RESPONSE: Denied. The standard of practice is to use data sufficient to meet the objectives of the approach used to specify the site ground motion characteristics. The approach followed in the 1999 Fault Evaluation Study and Seismic Hazard Assessment study (Geomatrix Consultants, Inc., 1999a)[3] was to use multiple empirical ground motion models to characterize the site ground motions, which is a standard approach for probabilistic seismic hazard analysis. In order to use empirical models based on California strong motion data, it was necessary to account for the average difference expected between the response of sites representative of the California strong motion data base and the Skull Valley site. The general characteristics of California soil sites are a relatively deep soil column with a gradually increasing shear wave velocity overlying rocks, which also display a gradient in shear wave velocity. The general characteristics of the Skull Valley site are a shallow soil column overlying a column of semi-consolidated Tertiary sediments. These are underlain by rocks having less of a velocity gradient than exhibited in California crustal rocks. Relative site

[3] Geomatrix Consultants, Inc., 1999a, Fault evaluation study and seismic hazard assessment, Private Fuel Storage Facility, Skull Valley, Utah: report prepared for Stone & Webster Engineering Corporation, February, 3 vols.

response analyses were used to characterize the average difference in response between these two site conditions.

To do these analyses, the gross characteristics of the Skull Valley site are required. These were provided by the seismic refraction data and the site borings. The velocities obtained by the Geosphere seismic refraction survey for the shallow layers were later confirmed by the second geophysical survey. These velocities are consistent with down-hole measurements reported in the literature for similar materials in the Salt Lake Valley. The underlying Tertiary sediments belong to a unit that is also present in the Salt Lake Valley for which there are reported velocity data. A range of velocities for the subsurface materials was used to represent the uncertainties in the subsurface material properties. The computed average relative response was then conservatively smoothed to produce the average scaling for site response between California firm soil site motions and the Skull Valley site motions.

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?

APPLICANT'S RESPONSE: Admitted. However, as indicated in the response to Request for Admission No. 2, the key properties needed for evaluating the average relative response between California deep soil sites and the Skull Valley site are the location and values for significant velocity changes. The refraction surveys combined with site boring data provided sufficient information to define the major layers in the

subsurface and the velocities obtained are consistent with data reported in the literature for similar materials in north-central Utah.

In addition, the cone penetration testing program, identified in the response to Request for Admission No. 1, included down-hole primary (compression) and shear wave velocity measurements at numerous locations across the pad emplacement area, as well as under the proposed location of the Canister Transfer Building.

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

APPLICANT'S RESPONSE: PFS objects to this contention as overbroad. It is unclear from the request what type of "ground motion modeling studies" the State's request concerns, and whether or not this request is limited to the type of ground motion modeling studies related to site characterization for the PFSF. Nevertheless, without waiving its objection, PFS denies this request. The depth to bedrock is a significant input parameter to the relative response analyses used in this study only in terms of its relative location with respect to typical California firm soil site recording stations.

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

APPLICANT'S RESPONSE: Denied. The depth to bedrock is known with sufficient precision to perform the relative response analyses used to characterize site ground motions in the 1999 Fault Evaluation Study and Seismic Hazard Assessment (Geomatrix Consultants, Inc., 1999a). The sediment depth is on the order of 400 to 800

feet, and variations within this range would not have a significant effect on the conclusions reached concerning the appropriate ground motion models.

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?

APPLICANT'S RESPONSE: PFS objects to this request as a compound question. Fed. R. Civ. P. 36 ("[e]ach matter of which an admission is sought shall be separately set forth"). The State requests admissions regarding whether or not: (1) "undrained shear strength is an important input parameter for geotechnical design," and (2) "the value of undrained shear strength used for the PFS[F] design calculations . . . was obtained from only two laboratory tests." The answers to these two requests may or may not be the same. PFS also objects to this request as overbroad. The State requests admission for an "approximate 150-acre facility." However, the important to safety areas for which Contention Utah L is relevant, principally the storage cask pad emplacement area and the canister transfer building, amounts to approximately 60 acres. The State's request regarding a "150-acre facility" goes beyond the scope of the contention as admitted by the Board.

Nevertheless, without waiving its objections, PFS admits that the value of undrained shear strength used for the PFS design calculations was obtained from two laboratory tests. However, as indicated in the response to PFSF SAR RAI No. 2, Question 2-2, these tests provide conservative results that are applicable for the upper 25

to 30 ft over the site because of the consistency of the subsurface data from boring to boring. The results from testing these two specimens are considered to be conservative for the soils in the upper layer because they were obtained from testing specimens from the upper layer where the Standard Penetration Test (SPT) blow count was less than or equal to the average value of all samples obtained in this layer. The SPT blow count is directly related to the strength of soils; i.e., higher strength will result in higher blow counts. See the discussion regarding variability of SPT N-values across the site in paragraphs 2 through 5 of Enclosure Item 4 in the PFS Letter, Donnell to Delligatti, Submittal of Commitment Resolution Information, dated 3/24/99. As indicated in paragraph 5,

> [T]he samples that were tested for strength and compressibility were representative of the lower blow count soils and, thus, extrapolating the results of those tests to the other soils within the upper layer that had higher blow counts should provide conservative estimates of the strength and compressibility for those soils.

Further, additional triaxial shear tests have been performed on samples obtained from the site. Three consolidated–undrained triaxial tests were performed in developing the response to the NRC request that was made in the teleconference of 3/16/99. The results of these tests, as well as those from two additional consolidated–undrained triaxial tests that were performed on undisturbed samples that were obtained in the vicinity of the Canister Transfer Building, located approximately 150 ft northeast of Boring D-4, are included on the figures attached to the enclosure to the PFS letter, Donnell to Delligatti,

Submittal of Commitment Resolution Information, dated 3/31/99. These results all indicate that it is conservative to use the results from the original two UU tests as representative of the upper layer at the site.

Moreover, recent cone penetration testing performed at the site, identified in the response to Request for Admission No. 1, includes plots of undrained shear strength vs. depth. As indicated in paragraph 4 of the enclosure to the PFS letter, Donnell to Delligatti, Submittal of Commitment Resolution No.4 Information, dated 5/28/99, the profiles of strength and compressibility included in the report of the cone penetration testing (ConeTec, 1999) demonstrate that the underlying soils are stronger and less compressible than those at the shallower depth. Therefore, the analyses of the stability and settlements of the cask storage pads based on the results of laboratory tests that were performed at depths of ~10 to 12 ft are conservative.

REQUEST FOR ADMISSION NOs. 7-8. Requests for Admissions Nos. 8-9 [sic][4] 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?

APPLICANT'S RESPONSE: Admitted. All sampling operations cause disturbance.

[4] The State references Request for Admissions Nos. 8-9, but appears to be addressing Request for Admissions Nos. 7-8. See State's Third Discovery Request at 17.

REQUEST FOR ADMISSION NO. 8. Do you admit than 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?

APPLICANT'S RESPONSE: PFS objects to this request as vague, Dubin v. E.F. Hutton, 125 F.R.D. 372, 376 (S.D.N.Y. 1989), in that the term "geotechnical properties (e.g., shear strength and consolidation)" is undefined and open-ended. PFS also objects to this request as a compound question. Fed. R. Civ. P. 36. The State requests admissions regarding the effects of sample disturbance on the results and calculations of: (1) "geotechnical properties" generally, (2) "shear strength" specifically, and (2) "consolidation" specifically. The answers to these three requests may or may not be the same.

Nevertheless, without waiving its objections, PFS admits that the shear strength measured in UU tests generally is lower for disturbed samples than for undisturbed samples, and therefore, using values obtained from testing disturbed samples would bias the results such that they would be conservative. Similarly, consolidation testing of disturbed specimens would exhibit flattened strain vs log stress curves, which would result in overestimating the recompression ratio and, most likely, underestimating the maximum past pressure. Both of these factors would conservatively bias the results of calculations such that estimated settlements based on the results of testing disturbed samples would be higher than those estimated based on the results of testing high-quality undisturbed samples.

Such disturbance was not exhibited in the results of the consolidation tests reported in the SAR (Appendix 2A, Attachment 2). Rather, the consolidation test plots of strain vs log stress in the SAR indicate well defined "knees" between the overconsolidation and normal consolidation portions of the loadings, which is indicative of high-quality consolidation specimens.

REQUEST FOR ADMISSIONS NOs. 9 -10. Requests for Admissions Nos. 10-11 [sic][5] 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:

- *Moist unit weight = dry unit weight x (1+ moisture content/100)*
- *For these samples dry unit weight = (67 pcf + 58 pcf)/2 = 62.5 pcf*
- *Moisture content = (27.4 % + 35.6%) / 2 = 31.5 percent*
- *Moist unit weight = 62.5 pcf (1+ 0.315) = 82.2 pcf*
- *Depth of overburden equivalent to 1.3 ksf = 1300 psf / 82.2 pcf = 15.8 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."

[5] The State references Request for Admissions Nos. 10-11, but appears to be addressing Request for Admissions Nos. 9-10. See State's Third Discovery Request at 18.

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)?

APPLICANT'S RESPONSE: Admitted.

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)?

APPLICANT'S RESPONSE: Denied. The confining pressure applied during testing of these samples was significantly less than the confining pressures that will exist underneath the storage pads following construction. At this depth in the profile, the final effective stresses are expected to be approximately 2.18 ksf, based on the loading at the base of the cask storage pads of 1.93 ksf (Stone & Webster Calculation 05996.01-G(B)-03-2, *Estimate Static Settlement of Storage Pads,* July 7, 1997, at 30). Therefore, using a confining stress of 1.3 ksf to model the final conditions under the storage pads underestimates the undrained shear strength, which is conservative from an engineering perspective.

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?

APPLICANT'S RESPONSE: PFS objects to this request as a compound question. Fed. R. Civ. P. 36. The State requests admissions that "split-spoon sampling": (1) "is a form of disturbed sampling," (2) "is of little value in gaining samples for laboratory test for undrained shear strength," (3) "is of little value in gaining samples for

laboratory test for . . . consolidation properties," and (4) "is of little value in gaining samples for laboratory test for . . . collapse properties of fine-grained soils." The answers to these four requests may or may not be the same. PFS also objects to this request as vague and ambiguous. Dubin, 125 F.R.D. at 376. The term "of little value" is undefined.

Nevertheless, without waiving its objections, PFS admits that, as a form of disturbed sampling, split-spoon sampling is not a preferred method for obtaining undisturbed samples for performing triaxial tests or consolidation tests. However, split-spoon sampling was not used to obtain samples for laboratory tests of undrained shear strength, consolidation properties, or collapse potential. Undisturbed samples for performing the tests identified above were obtained using thin-walled tube samples, meeting the requirements of ASTM D1587, as specified in Regulatory Position 6 of USNRC Regulatory Guide 1.132, "Site Investigations for Foundations of Nuclear Power Plants."

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?

APPLICANT'S RESPONSE: PFS objects to this request as a compound question. Fed. R. Civ. P. 36. The State requests admissions that both: (1) "the majority . . . of the sampling done in the upper 30 to 35 feet . . . was done with split-spoon sampling," and (2) "the majority of sampling done in the upper 30 to 35 feet . . . has little value in determining undrained shear strength and consolidation properties." The

answers to these two requests may or may not be the same. PFS also objects to this request as vague and ambiguous. Dubin, 125 F.R.D. at 376. The term "has little value" is undefined.

Nevertheless, without waiving its objections, PFS denies the request. As indicated in the response to Request for Admission No. 1, a cone penetration testing ("CPT") program was completed recently at the site. This program obtained additional subsurface data in the form of continuous profiles of tip resistance and sleeve friction resistance in a grid pattern of ~300 ft. Seismic velocities, both primary wave and shear wave, were measured at various locations across the pad emplacement area and under the location of the Canister Transfer Building. Dilatometer soundings were made at locations selected to measure, in situ, the compressibility of the soils found to have the lowest tip resistances in the CPTs. This program provides a substantial volume of additional subsurface information, such that the original split-spoon sampling no longer represents greater than 80 percent of the sampling done in the upper layer. The data obtained in this program supplement the available data for demonstrating that the site is suitable for the proposed Private Fuel Storage Facility.

PFS denies that split-spoon sampling "has little value" in determining soil properties. Split-spoon sampling is not intended to obtain samples for direct measurement of undrained shear strength and consolidation properties in the laboratory. The value of the split-spoon sampling is that it is performed using the Standard Penetration Test ("SPT"), which is the "standard" test performed in borings performed to

obtain information about subsurface soils at a site. Correlations exist between the SPT N-value and the undrained shear strength and consolidation properties. In addition, this type of sampling obtains a sample that is suitable for visual classification and for measurement of index properties, which also are correlated with respect to undrained shear strength and consolidation properties. Therefore, split-spoon sampling, which is a standard practice in geotechnical site investigations, has 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?

APPLICANT'S RESPONSE: PFS objects to this request as a compound question. Fed. R. Civ. P. 36. The State requests admissions that: (1) "an applied load of 0.5 tsf was used for some samples inundated with distilled water during consolidation testing, "and" (2) "that this applied constant load during wetting under-represents the actual foundation loads at the PFS[F] site." The answers to these two requests may or may not be the same.

Nevertheless, without waiving its objection, PFS admits that some samples were inundated with water during consolidation testing when the applied load reached 0.5 tsf and that this applied load represents a stress that was lower than those that will exist under the foundations. However, the samples remained inundated throughout the remainder of the consolidation tests. The purpose of the inundation was to measure the

collapse potential of the soils. If susceptible to collapse, they would have done so at some point during the performance of the consolidation tests. The fact that they were inundated at a stress that was lower than the stresses expected due to the foundation loads would not have prevented collapse at a higher stress level if the soils were susceptible to collapse. These specimens did not collapse at any of the stress levels imposed during these tests, including those as high as 16 ksf, which is greatly in excess of those to be imposed due to the foundation loads (<2 ksf). ASTM D5333 – 92, "Standard Test Method for Measurement of Collapse Potential of Soils", does not require that the specimen be inundated at a particular stress level.

REQUEST FOR ADMISSION NO. 14. Do you admit that textbook values of $C\alpha$ were used in settlement calculations instead of those values obtained from the field laboratory test program?

APPLICANT'S RESPONSE: Denied. Values of $C\alpha$ measured in the consolidation tests were used in calculating settlements.

REQUEST FOR ADMISSION NO. 15. Do you admit that inputted $C\alpha$ textbook values may underestimate the actual settlement because they are smaller than the values obtained from the field and laboratory program?

APPLICANT'S RESPONSE: PFS also objects to this request as vague. Dubin, 125 F.R.D. at 376. The term "inputted $C\alpha$ textbook values" is undefined. Nevertheless, without waiving its objections, PFS denies the request. Textbook values of $C\alpha$ were not "inputted" in the settlement analyses. See the response to Request for Admission No. 14 for additional information.

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?

APPLICANT'S RESPONSE: Admitted. The apparent preconsolidation of these soils is, most likely, 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?

APPLICANT'S RESPONSE: Admitted. However, additional consolidation testing performed on undisturbed samples obtained from borings that have been drilled recently in the area of the proposed location of the Canister Transfer Building indicates that the apparent preconsolidation of the deeper soil within the upper layer is greater than that used to estimate settlements in this material.

The purpose of these borings and laboratory tests was to document the subsurface conditions underlying the QA Category I Canister Transfer Building. The results of this subsurface investigation and laboratory testing program are being finalized at this time and will be reported to the NRC as soon as they are available.

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?

APPLICANT'S RESPONSE: Denied. Page 17 of the subject calculation indicates that the value of Poisson's ratio for the upper layer is based on the discussion

presented on pages 17A and 17B. Page 17B of that calculation indicates that the recommended value of Poisson's ratio is consistent with the value calculated based on P and S-wave velocities that fall within the ranges reported by Geosphere (in Appendix 2B of the SAR) for the site. Page 17 also reports that the recommended value of Poisson's ratio for Layers 2 and 3 are similarly consistent with those calculated based on P and S-wave velocities that fall within the ranges reported by Geosphere for the site. Page 17 of the subject calculation also reports values of Poisson's ratio from textbooks, to facilitate comparison with the recommended values.

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 [sic] cohesive?

APPLICANT'S RESPONSE: PFS objects to this request as vague. Dubin, 125 F.R.D. at 376. PFS is not aware of a geotechnical report identified as Attachment A to SAR Appendix 2A." Nevertheless, without waiving its objection, PFS admits that SAR Appendix 2A describes soils in the upper approximately 30 feet of the PFSF site as predominantly 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?

APPLICANT'S RESPONSE: Admitted. Page 24 of the subject calculation mistakenly asserts that Layer 1 is mostly nonplastic silt. The boring logs generally

describe these soils as slightly to moderately plastic, and this is corroborated by the laboratory test data.

Historically, the coefficient of vertical subgrade reaction was used in the design of mat foundations. On this project, however, a more sophisticated, finite element analysis that used the shear moduli and Poisson's ratio values, rather than the coefficient of vertical subgrade reaction, to represent the soil under the foundation, was used to design the mats. Therefore, this value of the coefficient of vertical subgrade reaction was not used in the design.

Stone & Webster will revise the subject calculation to delete the discussion of coefficient of vertical subgrade reaction, since it is not used. In addition, the appropriate sections of the design criteria and the SAR will be updated to reflect this revision.

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?

APPLICANT'S RESPONSE: Admitted.

REQUEST FOR ADMISSION NO. 23.[6] Do you admit that standard geotechnical practice is to use an adhesion factor (Ca), which is some fraction of the undrained shear strength?

APPLICANT'S RESPONSE: PFS objects to this request as overbroad. The term "standard geotechnical practice" is undefined and open-ended. There is no

[6] The State's Third Set of Discovery Requests does not provide a Request for Admission No. 22 for Utah Contention L. See State's Third Discovery Request at 21.

indication that the scope of this request is limited to geotechnical practice within the scope of characterization of the PFSF site. PFS objects to this request as it addresses general geotechnical practice not related to the investigations required for ISFSI licensing. Nevertheless, without waiving its objections, PFS denies the request. The use of an adhesion factor that is some fraction of the undrained shear strength is not a standard geotechnical practice with respect to sliding stability of foundations on cohesive soils. See Teng, W.C., Foundation Design, Prentice-Hall, Inc., Englewood Cliffs, NJ, 1962, p 321; Peck, R. B., Hanson, W.E., and Thornburn, T.H., Foundation Engineering, John Wiley & Sons, New York, NY, 1974, p 426.

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?

APPLICANT'S RESPONSE: Denied. See response to Request for Admission No. 23.

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.

APPLICANT'S RESPONSE: PFS takes exception to any allegation that its geotechnical investigations performed at the PFSF site constitute a "sparse sampling program." As indicated in the response to Request for Admission No. 1, a cone penetration testing program was completed recently at the site. This program provides additional subsurface information to supplement the available data for substantiating that the site is suitable for the proposed Private Fuel Storage Facility. This program obtained additional subsurface data in the form of continuous profiles of tip resistance and sleeve friction resistance in a grid pattern of ~300 ft over the entire cask storage pad emplacement area. The profiles of strength and compressibility included in the report of the cone penetration testing (ConeTec, 1999) demonstrate that the underlying soils are stronger and less compressible than those at the shallower depth. Therefore, the analyses of the stability and settlements of the cask storage pads based on the results of laboratory tests that were performed at depths of ~10 to 12 ft. are conservative.

Additional borings have been drilled recently in the area of the proposed location of the Canister Transfer Building, and laboratory testing of undisturbed samples from these borings is nearly complete. The purpose of these borings and laboratory tests is to document the subsurface conditions underlying the QA Category I Canister Transfer Building. The results of this subsurface investigation and laboratory testing program are being finalized at this time and will be reported to the NRC as soon as they are available.

Subsurface investigations of the other site buildings, which are not classified as structures important to safety, will be performed, as deemed necessary by applicable codes and standards, at a later date.

The critical layers were identified based on the Standard Penetration Test blow count values and the visual classification of the soil samples obtained in the borings. The generalized subsurface profile, developed based on the borings, was corroborated by the results of the seismic refraction survey (Geosphere, SAR Appendix 2B). These data demonstrated that the critical layer with respect to stability and settlement of the proposed structures was the upper ~30-ft thick layer.

Undisturbed samples were obtained for laboratory testing of the zone within the upper layer that exhibited the lower blow counts within the layer underlying the proposed foundations. As indicated in the response to SAR RAI No. 2, Question 2-2, the locations of the specimens tested for strength and compressibility fall within the zone where the average and median blow counts for each 5-ft elevation interval were less than or equal to the average value for the entire layer (15 blows/ft). Since the strength of these soils is directly related to the blow count, testing soils whose blow count is less than the average provides a conservative estimate of the strength of the soil. In addition, since the compressibility of these soils is inversely related to their blow count, testing soils whose blow count is less than the average provides a conservative estimate of their compressibility and, hence, result in conservative (i.e., higher) estimates of settlements that the cask storage pads will experience.

INTERROGATORY NO. 5. Describe and quantify the uncertainties associated with elastic properties (*e.g.*, shear, Youngs, 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.

APPLICANT'S RESPONSE: The shear wave values for the shallow layers were not "determined indirectly," but were directly measured in a shear wave refraction survey. The values for the deeper Tertiary sediments were taken from reported velocities for this unit from other locations in north-central Utah. The uncertainties in the shear wave velocities of the subsurface materials and how they were incorporated into the ground motion modeling studies are described in Appendix F of Fault Evaluation Study and Seismic Hazard Assessment (Geomatrix Consultants, Inc., 1999a). The ground motion models used in the seismic hazard assessment were defined in part by scaling California empirical soil site attenuation models by the relative response of the Skull Valley site compared to that of a typical California soil site recording location. Site response analyses were performed for the Skull Valley site using the full range in measured values for the shallow layers and the full range in reported values for the deep layers. Uncertainty in the shear modulus reduction and damping relationships for the site sediments was incorporated by using two alternative sets of properties with significantly different characteristics. The response spectra for the computed surface motions were then divided by response spectra computed for a typical California soil site using the same level of input motion. The resulting ratios of computed site response (ratios of computed surface response spectra) were then averaged and the average conservatively

smoothed to produce a scaling factor to adjust California empirical models to Skull Valley conditions.

The dynamic properties for the analysis of the structural response of the Canister Transfer Building and the cask storage pads presented in the SAR (e.g., Figure 2.6-13) were developed from the measured velocities in the shallow soils. [Note: the dynamic properties are being updated in light of the 1999 ground motion assessment (Geomatrix, 1999a), the selection of a 1,000-year return period for the design level, and the recently acquired seismic cone penetration testing data.] The shear and compression wave velocities were used to determine the shear modulus and constrained modulus, respectively. The other parameters, Youngs and bulk modulus and Poisson's ratio for dynamic analyses are derived from these two assessments using elastic theory.

In the seismic analysis of the Canister Transfer Building, uncertainties in the soil properties were accounted for by varying the soil shear modulus as described in Section 3.3.1.7 of ASCE 4-86. In addition, uncertainties in the analysis (including those introduced by soil structure interaction) were considered by broadening the in-structure response spectra as described in Section 3.4.2.3 of ASCE 4-86.

INTERROGATORY NO. 6. The Geotechnical Laboratory Report, SAR App. 2A, 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.

APPLICANT'S RESPONSE: PFS determined, based on the results of the consolidation tests, that "the secondary consolidation is significant after exceeding the maximum past pressure." SAR App. 2A, Att. 2 at 2. The loadings due to the proposed structures will be much less than the maximum past pressure for these soils; therefore, further investigation of the "large amount of secondary consolidation" was not warranted. This large amount of secondary consolidation occurs gradually with time, as indicated in the plots of strain vs. log of time included in the SAR. This behavior is consistent with what is expected for secondary compression and was evident over extremely long cycles of loading, as much as 16,800 minutes for the loading from 1 to 2 tsf for Sample C2-U2C. This strain does not represent collapse of the 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.

APPLICANT'S RESPONSE: The 1999 Fault Evaluation Study and Seismic Hazard Assessment (Geomatrix Consultants, Inc., 1999a) presents a detailed assessment of the fault rupture hazard at the Skull Valley site, including the potential for surface displacements beneath the site. As stated in Section 7.4 of that report, the level of displacement at the return periods of interest to site design is less than 0.1 cm. This displacement is less than tolerances considered for settlement, and thus need not be considered explicitly in the design for the foundation systems.

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 PFS 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.

APPLICANT'S RESPONSE: PFS objects to this request as outside the scope of the contention as admitted by the Board. Contention Utah L is limited to alleged variation in ground motion due to "near surface traces of potentially capable faults (the Stansbury and Cedar Mountain faults)." State's Contention at 82-83. This interrogatory concerns whether or not identical time histories have been used for all design work, and is not connected to the issue of "near surface traces of potentially capable faults." Nevertheless, without waiving its objection, PFS states that different time histories were used for the seismic analysis of the pads (performed by Holtec) and the Canister Transfer Building (performed by Stone & Webster). These two analyses are independent of one another. The two different organizations independently developed time histories, and both sets of time histories satisfy the applicable requirements. Further, there is no need to use the same time histories.

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.

APPLICANT'S RESPONSE: PFS objects to this request as outside the scope of the contention as admitted by the Board. See Utah L - Response to Interrogatory No. 8. This interrogatory concerns "spectrum matching requirements" and "applicable damping

values" for the design of building foundations. This is outside the scope of the contention which includes only the issue of "near surface traces of potentially capable faults (the Stansbury and Cedar Mountain faults)." State's Contentions at 82-83. Nevertheless, without waiving its objection, PFS states that, unlike Regulatory Guide 1.60, which defines the ground motion by a set of response spectra for different damping ratios, the site-specific ground motion is specified only by the applicable five percent damped response spectrum. The response spectrum of the time histories are calculated at five percent damping to be consistent with the defined ground motion.

The artificial time histories generated in Calculation 05996.01-SC-3 meet the PSDF requirements of SRP 3.7.1. The time histories were generated to envelop preliminary ground response spectra anchored to 0.67 g in the horizontal directions and 0.69 g in the vertical direction. The target PSDFs are derived from the latest design ground response spectra developed by Geomatrix (1000 year return period) which are anchored to 0.40 g in the horizontal directions and 0.39 g in the vertical direction. Because of this, the calculated PSDF easily envelops the target PSDF for all three time histories. See Revision 1 of Calculation 05996.02-SC-3.

Since the time histories conservatively simulate the specified ground spectrum for 5% damping, and the power spectrum density function ("PSDF") of the time histories envelopes the target PSDF of the specified ground motion, the time histories have been shown to adequately and conservatively simulate the ground motion.

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?

APPLICANT'S RESPONSE: Fault "fling" refers to near-field directivity effects observed in strong ground motion recordings. These near-field effects were incorporated in the development of the new design spectra for the site (Development of Design Ground Motions for the Private Fuel Storage Facility, Geomatrix Consultants, Inc., 1999b).[7] The empirical model developed by Somerville and others (1997)[8] utilizes data from earthquakes where large near-field velocity pulses were observed (e.g., San Fernando, 1971; Imperial Valley, 1979; Morgan Hill, 1984; Northridge, 1994) to adjust empirical response spectra predictions. This model was used to modify the equal-hazard response spectra to account for near-source effects.

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.

APPLICANT'S RESPONSE: The ground motion models used to develop the site design ground motions (Geomatrix, 1999a, 1999b) are based on strong motion data

[7] Geomatrix Consultants, Inc., 1999b, Development of design ground motions for the Private Fuel Storage Facility, Skull Valley, Utah: report prepared for Stone & Webster Engineering Corporation, March.

[8] Somerville, P.G., Smith, N.F., Graves, R.W., and Abrahamson, N.A., 1997, Modification of empirical strong ground motion attenuation relations to include the amplitude and duration effects of rupture directivity: Seismological Research Letters, v. 68, p. 199-222.

recorded on soil sites, primarily in California, including in several cases data from the Northridge earthquake. These sites are typically located in basins and, therefore, contain basin effects as manifested in the amplitudes of the recorded strong ground motions. One of the empirical models used in the analysis (Campbell, 1997)[9] specifically incorporates a term for the depth of the basin in predicting ground motions, and a depth of 0.2 km (~600 ft) was used. Thus, it is not necessary to add an additional basin effect on the amplitude of the resulting response spectra. Furthermore, basin effects are typically manifested at low frequencies, and very conservative smoothing was used to develop the soil site adjustment factors to scale California soil site motions to Skull Valley conditions for low frequencies, below 1 Hz.

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.

APPLICANT'S RESPONSE: As described in response to Interrogatory No. 5, the presence of large velocity contrasts at shallow depths in the sediments was explicitly modeled in developing ground motion models for the evaluation of the shaking hazard at the site (Appendix F of Geomatrix Consultants, Inc., 1999a). The velocity contrasts were

[9] Campbell, K.W., 1997, Empirical near-source attenuation relationships for horizontal and vertical components of peak ground acceleration, peak ground velocity, and pseudo-absolute acceleration response spectra: Seismological Research Letters, v. 68, p. 154-179.

modeled as part of the relative response of the Skull Valley site compared to a typical California soil strong motion site..

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.

APPLICANT'S RESPONSE: The most recent guidance from the NRC (i.e., U.S. Nuclear Regulatory Commission Regulatory Guide 1.165) indicates that the design ground motions are to be specified at the surface in the free field. This is the approach taken in developing the site ground motions (Geomatrix Consultants, Inc., 1999a, 1999b).

C. DOCUMENTS REQUESTS – Utah Contention L

The State of Utah 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.

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.)

APPLICANT'S RESPONSE: The final design cross-sections used for engineering analysis and the engineering properties are included in the calculations, copies of which have already been produced. Other than the results of the cone penetration testing program, identified in the response to Request for Admission No. 1,

and the Canister Transfer Building borings and laboratory testing program, identified in the response to Request for Admission No. 17 and which is nearing completion, PFS is aware of no additional documents to produce at this time. PFS will notify the State upon updating its repository of documents relevant to Contention Utah L, maintained at Parsons Behle and Latimer in Salt Lake City.

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.

APPLICANT'S RESPONSE: Additional foundation profile lines have not been generated. PFS is aware of no additional documents to produce at this time. PFS will notify the State upon updating its repository of documents relevant to the State's contentions, maintained at Parsons, Behle, and Latimer in Salt Lake City.

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.

APPLICANT'S RESPONSE: The basis for the dynamic design properties below a depth of 100 feet is documented in Geomatrix Calculation 05996.01-G(P05)-1. The documentation files at Geomatrix will be reviewed for additional documents relating to the estimation of the geotechnical and dynamic design properties below 100 feet and uncertainties associated with these estimates. PFS will notify the State upon updating its repository of documents relevant to contention Utah L maintained at Parsons Behle and Latimer, in Salt Lake City.

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.

APPLICANT'S RESPONSE: The basis for Figure 2.6-13 is documented in Geomatrix Calculation 05996.01-G(P05)-1. Documentation files will be reviewed for additional 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. PFS will notify the State upon updating its repository of documents relevant to contention Utah L maintained at Parsons Behle and Latimer, in Salt Lake City.

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.).

APPLICANT'S RESPONSE: PFS will provide documents responsive to this request at its document repository maintained at Parsons Behle and Latimer, in Salt Lake City.

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

APPLICANT'S RESPONSE: PFS has produced and made available documents relating to selection of soil samples at its document repository at Parsons Behle and Latimer, in Salt Lake City. PFS is aware of no additional documents to produce at this

time. PFS will notify the State upon updating its repository of documents relevant to contention Utah L maintained at Parsons Behle and Latimer, in Salt Lake City.

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.

APPLICANT'S RESPONSE: Stone & Webster's standard practice for handling of undisturbed tube samples in the laboratory is described in Geotechnical Technical Procedure 3.5, "Logs of Undisturbed Samples." PFS is aware of no documents to produce at this time. PFS will notify the State upon updating its repository of documents relevant to contention Utah L maintained at Parsons Behle and Latimer, in Salt Lake City.

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.

APPLICANT'S RESPONSE: The following calculations used the undrained shear strength value of 2.2 ksf:

- 05996.01-G(B)-04, Rev 0 through Rev 3, "Stability Analyses of Storage Pads"
- 05996.01-G(B)-07, Rev 0 and Rev 1, "Allowable Bearing Capacity and Static Settlement of Strip and Square Footings"
- 05996.01-G(B)-11, Rev 0, "Dynamic Settlements of the Soils Underlying the Site"
- 05996.02-G(B)-13, Rev 0, "Allowable Bearing Capacity of the Canister Transfer Building Supported on a Mat Foundation"
- 0599602-SC-09-0, "PFSF/Skull Valley/ Stability of Canister Transfer Building", 12/14/98.

- 05996.02-G(B)-18, Rev 0, "Determine the Thickness of Structural Fill Required in Areas Where the Transporter Will Travel Carrying Fully Loaded Casks"
- CEC (Job Number 1083) Calculation SC(PO17)-1 Rev 0, "Storage Pad Analysis and Design," June 20, 1997.

PFS has produced and made available PFSF calculations at its document repository at Parsons Behle and Latimer, in Salt Lake City. To the extent they have not already been produced, the calculations identified above will be produced and made available at PFS's document repository. PFS will notify the State upon updating its repository of documents relevant to contention Utah L maintained at Parsons Behle and Latimer.

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.

APPLICANT'S RESPONSE: PFS is aware of no additional documents to produce at this time relative to the stated conclusion, which is taken from Attachment 2 of Appendix 2A of the SAR. PFS will notify the State upon updating its repository of documents relevant to contention Utah L maintained at Parsons, Behle, and Latimer, in Salt Lake City.

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.

APPLICANT'S RESPONSE: PFS has produced and made available documents relating to selection of soil samples at its document repository at Parsons Behle and Latimer, in Salt Lake City. PFS is aware of no additional documents to produce in

response to this request at this time. PFS will notify the State upon updating its repository of documents relevant to contention Utah L maintained at Parsons Behle and Latimer.

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

APPLICANT'S RESPONSE: See response to Interrogatory No. 4, response to Request for Admission No. 1 and No. 17 and response to SAR RAI No. 2, Question 2-2. PFS is aware of no additional documents to produce at this time. PFS will notify the State upon updating its repository of documents relevant to the State's contentions, maintained at Parsons, Behle, and Latimer in Salt Lake City.

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.

APPLICANT'S RESPONSE: PFS objects to this request as outside the scope of the contention as admitted by the Board. See Utah L - Responses to Interrogatories No. 8 and No. 9. This document request concerns "how...compatible target [power spectrum density functions] were computed for the facilities." This request is not connected to the contention issue of alleged "near surface tracer of potentially capable faults," and therefore is outside the scope of the contention as admitted by the Board. See State's Contentions at 82-83. Nevertheless, without waiving its objection, PFS states that

Revision 1 of Calculation 05996.02-SC-3 provides documentation related to this document request. All documentation files will be reviewed for additional documents related to development of the compatible target PSDFs computed for the facilities. PFS will notify the State upon updating its repository of documents relevant to the State's contentions maintained at Parsons Behle and Latimer, in Salt Lake City.

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.

APPLICANT'S RESPONSE: PFS objects to this request as outside the scope of the contention as admitted by the Board. See Utah L - Responses to Interrogatories No. 8 and No. 9. This document request concerns whether "the developed time histories of motion have drift in...the velocity and displacement time histories." This request is not connected to the contention issue of alleged "near surface traces of potentially capable faults," and therefore is outside of the scope of the contention as admitted by the Board. See State's Contentions at 82-83. Nevertheless, without waiving its objection, PFS states that the artificial time histories generated for use in the seismic analysis of the Canister Transfer Building in Calculation 05996.02-SC-3-0 were baseline-corrected using the SWEC program "INTBSL" to minimize drift in the velocity and displacement time histories. PFS is aware of no additional documents to produce at this time. PFS will notify the State upon updating its repository of documents maintained at Parsons Behle and Latimer.

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.

APPLICANT'S RESPONSE: See SAR App. 2B. A monitoring well was installed to confirm depth to ground water in accordance with the requirements of Engineering Services Scope of Work for Test Borings for Canister Transfer Building, ESSOW No. 05996.02-G003 (Rev. 0), November 1998. The results of this subsurface investigation and laboratory testing of the samples are being finalized at this time and will be reported to the NRC when they are available. A copy of the field piezometer installation report, which documents the depth to the ground water for this well, will be produced and made available at PFS's document repository at Parsons Behle and Latimer, in Salt Lake City. Results of groundwater depth measurements will be produced and made available at PFS's document repository at Parsons Behle and Latimer, in Salt Lake City. PFS will notify the State upon updating its repository of documents relevant to the State's contentions maintained at Parsons Behle and Latimer.

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.

APPLICANT'S RESPONSE: Seasonal variations in groundwater levels are indicated on Figure 5 of Hood and Waddell (1968) based on widely scattered wells in Skull Valley. PFS is aware of no additional documents to produce at this time. PFS will notify the State upon updating its repository of documents relevant to the State's contentions maintained at Parsons Behle and Latimer.

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

APPLICANT'S RESPONSE: See the response to Document Request No. 14 regarding the groundwater observation well. Calculation 05996.02-G(B)-15-0, "Determination of Aquifer Permeability from Constant Head Test and Estimation of Radius of Influence for the Proposed Water Well" reduces the data from the testing performed in this well. In addition, SAR Section 2.4.1.2, Hydrosphere, includes a discussion regarding the location of the groundwater table at the site. Groundwater gradients in Skull Valley are indicated in Hood and Waddell (1968) based on widely scattered wells in Skull Valley. SAR Section 2.5.2, Site Characteristics, indicates that ground water flows from the south to the north in Skull Valley, toward Great Salt Lake, and based on Plate 1 of Hood and Waddell (1968), the hydraulic gradient is estimated to be approximately 9.5×10^{-4}. PFS is aware of no additional documents to produce at this time. PFS will notify the State upon updating its repository of documents relevant to the State's contentions, maintained at Parsons, Behle, and Latimer in Salt Lake City.

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.

APPLICANT'S RESPONSE: SAR Sections 2.5.1, Regional Characteristics, and 2.6.1.9, Site Groundwater Conditions, include discussion of artesian conditions in Skull Valley. PFS is aware of no additional documents to produce at this time. PFS will

notify the State upon updating its repository of documents relevant to the State's contentions, maintained at Parsons, Behle, and Latimer in Salt Lake City.

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.

APPLICANT'S RESPONSE: PFS is aware of no additional documents relative to this issue to produce at this time.

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.

APPLICANT'S RESPONSE: The laboratory test results included in Appendix 2A, Attachment 2 of the SAR form the bases for the properties shown in Section 2.6.1.11 of the SAR. Plots of index properties and shear strength vs. depth are included in the figures attached to the enclosure to PFS Letter, Donnell to Delligatti, Submittal of Commitment Resolution Information, dated March 31, 1999.

PFS has produced and made available documents relating to testing of soil properties at its document repository at Parsons Behle and Latimer, in Salt Lake City. PFS will notify the State upon updating its repository of documents relevant to contention Utah L maintained at Parsons Behle and Latimer.

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 soluable salts.

APPLICANT'S RESPONSE: PFS is aware of no additional documents to produce at this time. PFS will notify the State upon updating its repository of documents relevant to contention Utah L maintained at Parsons Behle and Latimer.

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.

APPLICANT'S RESPONSE: The instruction manual for operating the conductance meter used to measure conductivity will be produced and made available at PFS's document repository at Parsons Behle and Latimer, in Salt Lake City. PFS has produced and made available other documents relating to soil testing at its document repository at Parsons Behle and Latimer. PFS is aware of no other additional documents to produce at this time. PFS will notify the State upon updating its repository of documents relevant to contention Utah L maintained at Parsons Behle and Latimer.

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

APPLICANT'S RESPONSE: PFS objects to this request as outside the scope of the contention as admitted by the Licensing Board. Contention Utah L concerns site characterization of the geotechnical and seismic properties of the PFSF site. The

contention does not include the design of engineered features to be constructed on the PFSF site, including the retention basin.

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

APPLICANT'S RESPONSE: PFS objects to this request as outside the scope of the contention as admitted by the Licensing Board. Contention Utah L concerns site characterization of the geotechnical and seismic properties of the PFSF site. The contention does not include the design of engineered features to be constructed on the PFSF site, including the design of foundations for structures to be constructed at the PFSF.

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

APPLICANT'S RESPONSE: A review of the calculations indicates there are currently no calculations that 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).

APPLICANT'S RESPONSE: Vucetic and Dobry (1991) published generic shear modulus reduction and damping ratio curves for normally and overconsolidated clayey silty soils with plastic indices of 0, 15, 30, 50, 100, and 200. Atterberg Limits

tests performed in 1997 by Stone and Webster Engineering Corporation, see laboratory test results summarized in Table 2 of Attachment 2 to Appendix 2A of SAR Rev. 0, were the basis for selecting the shear modulus reduction and damping ratio curves for the top 30 ft from on Vucetic and Dobry (1991).

Below a depth of about 60 ft, the shear modulus reduction and damping ratio curves are based on the average of the curves for low-plasticity soil (Vucetic and Dobry, 1991) and the curves for sand (Seed and Idriss, 1970), as documented in Geomatrix Calculation 05996.01-G(PO5)-1.

Documentation files will be reviewed for documents relating to the use of the shear modulus reduction and damping ratio curves from Vucetic and Dobry (1991). PFS will notify the State upon updating its repository of documents relevant to contention Utah L maintained at Parsons Behle and Latimer, in Salt Lake City.

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

APPLICANT'S RESPONSE: PFS objects to this request as vague and ambiguous. Dubin, 125 F.R.D. at 376. The term "full undrained shear strength" is undefined and indeterminate. Nevertheless, without waiving its objections, PFS states that the following calculations used the undrained shear strength value of 2.2 ksf:

- 05996.01-G(B)-04, Rev 0 through Rev 3, "Stability Analyses of Storage Pads"
- 0599602-SC-09-0, "PFSF/Skull Valley/ Stability of Canister Transfer Building", 12/14/98.

- CEC (Job Number 1083) Calculation SC(PO17)-1 Rev 0, "Storage Pad Analysis and Design," June 20, 1997.

PFS has produced and made available PFSF calculations at its document repository at Parsons Behle and Latimer, in Salt Lake City. To the extent the calculations listed above have not already been produced, they will be produced and made available at PFS's document repository. PFS will notify the State upon updating its repository of documents relevant to contention Utah L maintained at Parsons Behle and Latimer.

IV. CONTENTION Z (No Action Alternative)

A. 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.

APPLICANT'S RESPONSE: PFS has already produced and made available documents relating to utilities needs for additional spent fuel storage capacity at its document repository at Parsons Behle and Latimer, in Salt Lake City. PFS will notify the State upon updating its repository of documents relevant to the admitted contention Utah Z maintained at Parsons Behle and Latimer.

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.

APPLICANT'S RESPONSE: PFS is aware of no documents at this time prepared by or for PFS that evaluate the benefits of the PFSF and other alternatives based

on the assumption that DOE will begin accepting SNF either prior to the year 2015, or after the year 2015. The analyses that have been prepared for PFS assume that DOE will begin accepting spent fuel in the year 2015. These documents have already been produced and made available at PFS's document repository at Parsons Behle and Latimer, in Salt Lake City. PFS will notify the State upon updating its repository of documents relevant to the admitted contention Utah Z maintained at Parsons Behle and Latimer.

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.

APPLICANT'S RESPONSE: PFS is aware of no documents at this time prepared by or for PFS that analyze at-reactor SNF storage costs based on the assumption that the PFSF will not be open to receive SNF until after the year 2002. The analyses that have been prepared for PFS assume that the PFSF will begin operations in the year 2002. These documents have already been produced and made available at PFS's document repository at Parsons Behle and Latimer, in Salt Lake City. PFS will notify the State upon updating its repository of documents relevant to the admitted contention Utah Z maintained at Parsons Behle and Latimer.

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.

APPLICANT'S RESPONSE: PFS has produced and made available documents relating to evaluation of the "No Build Alternative" at its document repository at Parsons

Behle and Latimer, in Salt Lake City. PFS will notify the State upon updating its repository of documents relevant to the admitted contention Utah Z maintained at Parsons Behle and Latimer.

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.

APPLICANT'S RESPONSE: PFS has already produced and made available documents which form the basis for the conclusion that not licensing and operating the PFSF "will increase the risk of early shutdown of operating reactors" at its document repository at Parsons Behle and Latimer, in Salt Lake City. PFS will notify the State upon updating its repository of documents relevant to the admitted contention Utah Z maintained at Parsons Behle and Latimer.

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.

APPLICANT'S RESPONSE: PFS has already produced and made available documents which formed the basis for drawing the conclusion that not licensing and operating the PFSF "will reduce the likelihood of life extension" at its document repository at Parsons Behle and Latimer, in Salt Lake City. PFS will notify the State upon updating its repository of documents relevant to the admitted contention Utah Z maintained at Parsons Behle and Latimer.

Respectfully submitted,

Paul Gaukler

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Ernest L. Blake, Jr.
Paul A. Gaukler
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Dated: June 28, 1999

Counsel for Private Fuel Storage L.L.C.

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
	)	
(Private Fuel Storage Facility)	)	ASLBP No. 97-732-02-ISFSI

CERTIFICATE OF SERVICE

I hereby certify that copies of the Applicant's Objections and Non-proprietary Responses to State's Third Requests For Discovery and the Declarations of Jerry Cooper, Bruce Ebbeson, Paul A. Gaukler, John D. Parkyn, Paul Trudeau and Robert Youngs were served on the persons listed below (unless otherwise noted) by e-mail with conforming copies by U.S. mail, first class, postage prepaid, this 28th day of June 1999.

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* Susan F. Shankman
Deputy Director, Licensing & Inspection
Directorate, Spent Fuel Project Office
Office of Nuclear Material Safety & Safeguards
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Office of the Secretary
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001
Attention: Rulemakings and Adjudications Staff
e-mail: hearingdocket@nrc.gov
(Original and two copies)

* Adjudicatory File
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Paul A. Gaukler

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

Before the Atomic Safety And Licensing Board

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	)	
PRIVATE FUEL STORAGE L.L.C.	)	Docket No. 72-22
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(Private Fuel Storage Facility)	)	ASLBP No. 97-732-02-ISFSI

DECLARATION OF PAUL A. GAUKLER

Paul A. Gaukler states as follows under penalties of perjury:

1. I am counsel with ShawPittman in Washington, D.C.

2. I am duly authorized to verify Applicant's Response to State's Third Requests for Discovery; specifically, those responses to General Interrogatory Nos. 1-5.

3. I certify that the statements in such responses are true and correct to the best of my personal knowledge and belief.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on June 28, 1999.

Paul Gaukler

Paul A. Gaukler

UNITED STATES OF AMERICA
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In the Matter of	)	
	)	
PRIVATE FUEL STORAGE L.L.C.	)	Docket No. 72-22
	)	
(Private Fuel Storage Facility)	)	ASLBP No. 97-732-02-ISFSI

DECLARATION OF JERRY COOPER

Jerry Cooper states as follows under penalties of perjury:

1. I am the Project Engineer with Stone & Webster Engineering Corporation (Stone & Webster) for the Private Fuel Storage Facility ("PFSF") project. As the Project Engineer for the PFSF, I am responsible for execution and integration of the technical activities for the project.

2. I am duly authorized to verify Applicant's Response to State's Third Requests for Discovery; specifically, the response to Request for Admission Nos. 14-15 with respect to Utah Contention S.

3. I certify that the statements and opinions in such responses are true and correct to the best of my personal knowledge and belief.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on June 28, 1999.

Jerry L Cooper

Jerry Cooper

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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In the Matter of	)	
	)	
PRIVATE FUEL STORAGE L.L.C.	)	Docket No. 72-22
	)	
(Private Fuel Storage Facility)	)	ASLBP No. 97-732-02-ISFSI

DECLARATION OF BRUCE EBBESON

Bruce Ebbeson states as follows under penalties of perjury:

1. I am a Senior Lead Structural Engineer with Stone & Webster Engineering Corporation (Stone & Webster) supporting the Private Fuel Storage Facility ("PFSF") project. As a Senior Lead Structural Engineer for the PFSF, I am responsible for performing the seismic analysis and structural design of the Canister Transfer Building.

2. I am duly authorized to verify Applicant's Response to State's Third Requests for Discovery; specifically, the response to Interrogatory Nos. 5 (last paragraph only), 8, and 9 with respect to Utah Contention L.

3. I certify that the statements and opinions in such responses are true and correct to the best of my personal knowledge and belief.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on June 28, 1999.

Bruce E. Ebbeson

Bruce E. Ebbeson

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**
	)	
(Private Fuel Storage Facility)	)	**ASLBP No. 97-732-02-ISFSI**

DECLARATION OF JOHN D. PARKYN

John D. Parkyn states as follows under penalties of perjury:

1. I am Chairman of the Board of Private Fuel Storage L.L.C. (PFS), a limited liability company organized and existing under the laws of the State of Delaware with its principal office currently located in La Crosse, Wisconsin.

2. I am duly authorized to verify Applicant's Response to State's Third Requests for Discovery; specifically, the responses to the Request for Admission Nos. 1-6 with respect to Utah Contention E and the Request for Admission Nos. 2-4 and 7-13 with respect to Utah Contention S.

3. I certify that the statements and opinions in such responses are true and correct to the best of my personal knowledge and belief.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on June 28, 1999.

John D. Parkyn

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
	)	
(Private Fuel Storage Facility)	)	ASLBP No. 97-732-02-ISFSI

DECLARATION OF PAUL TRUDEAU

Paul Trudeau states as follows under penalties of perjury:

1. I am a Senior Lead Geotechnical Engineer with Stone & Webster Engineering Corporation (Stone & Webster) supporting the Private Fuel Storage Facility ("PFSF") project. As a Senior Lead Geotechnical Engineer for the PFSF, I am responsible for all geotechnical engineering issues as they relate to the PFSF project.

2. I am duly authorized to verify Applicant's Response to State's Third Requests for Discovery; specifically, the response to Request for Admission Nos. 1, 3 (paragraph 2). 6-21, 23-24 and Interrogatory Nos. 4, 6 with respect to Utah Contention L.

3. I certify that the statements and opinions in such responses are true and correct to the best of my personal knowledge and belief.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on June 28, 1999.

Paul Trudeau

Paul Trudeau

UNITED STATES OF AMERICA
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PRIVATE FUEL STORAGE L.L.C.	)	Docket No. 72-22
	)	
(Private Fuel Storage Facility)	)	ASLBP No. 97-732-02-ISFSI

DECLARATION OF ROBERT R. YOUNGS

Robert R. Youngs states as follows under penalties of perjury:

1. I am a Geotechnical Consultant with Geomatrix Consulting, Inc., supporting Stone and Webster Engineering Corporation (Stone & Webster) on the Private Fuel Storage Facility ("PFSF") project. As a Geotechnical Consultant on the PFSF, I am responsible for development of ground motion models and assessment of earthquake ground shaking and fault displacement hazards.

2. I am duly authorized to verify Applicant's Response to State's Third Requests for Discovery; specifically, the response to Request for Admission Nos. 2-5 and Interrogatory Nos. 5, 7, 10-13 with respect to Utah Contention L.

3. I certify that the statements and opinions in such responses are true and correct to the best of my personal knowledge and belief.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on June 28, 1999.

Robert R. Youngs