



*Private Fuel Storage, L.L.C.*

*P.O. Box C4010, La Crosse, WI 54602-4010*

*Phone 303-741-7009 Fax: 303-741-7806*

*John L. Donnell, P.E., Project Director*

**April 14, 2000**

U.S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, D.C. 20555-0001

**COMMITMENT RESOLUTION LETTER #31**  
**DOCKET NO. 72-22 / TAC NO. L22462**  
**PRIVATE FUEL STORAGE FACILITY**  
**PRIVATE FUEL STORAGE L.L.C.**

In accordance with our April 10, 2000 conference call, Private Fuel Storage (PFS) submits the following resolution to NRC/CNWRA questions and comments regarding the meteorological data for the Private Fuel Storage Facility (PFSF). The NRC questions/comments are documented below followed by the PFS response.

**NRC Questions and Comments**

1. PFS needs to provide a comparative analysis of the 2-year site-specific meteorological data relative to longer-term historical data for the site area as a temporal representativeness demonstration for the site data.

**RESPONSE**

SAR Chapter 2, Section 2.3.2.1, states the following:

The meteorology of the Skull Valley site can be partially characterized using long-term meteorological data collected by the National Weather Service at the SLCIA (NOAA, 1992). This climatological data set is the most comprehensive available for this area. The SLCIA is located approximately 50 miles northeast of the site at an elevation of approximately 4,220 ft. With the PFSF site being located at an elevation of approximately 4,465 ft, meteorological data collected at SLCIA can be considered representative of the general climate of the site but need to be supplemented with data more representative of local conditions.

The valley location of the PFSF site has an influence on the local meteorology relative to that of SLCIA with the Stansbury and Oquirrh Mountains rising to elevations of above 10,000 ft between the two locations. The location of the Great Salt Lake to the north of Skull Valley as opposed to west and northwest of SLCIA also probably causes some meteorological differences between the two locations. Therefore, meteorological data collected in Skull Valley are also needed to characterize the local conditions. Monthly average temperature

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and precipitation data collected at various locations in Skull Valley are available from a book published by the Utah Climate Center (Ashcroft et al., 1992). The data collected at Dugway, located approximately 12 miles south of the PFSF site at an elevation of 4,340 ft, have the longest period of record (1950 - 1992) and appear to be the most reliable. Other useful data were collected at Iosepa South Ranch, which is located about 12 miles north of the PFSF site at an elevation of 4,415 ft, during the period from 1951 - 1958.

PFS believes the data sources evaluated (SLCIA, Dugway, and Iosepa South Ranch) are reliable and provide information representative of the local meteorological conditions. The temporal representativeness of the site data are demonstrated by the following discussion and comparisons provided in attached Tables 2.3-3, 2.3-4, 2.3-5, and 2.3-11 for precipitation, temperature, wind, and relative humidity, respectively.

Normal monthly precipitation tends to be concentrated in the winter and spring months with the larger amounts occurring between December and May and the least amounts in the summer and early fall. The annual average rainfall rate at Salt Lake City is 15.3 inches per year with a record 24-hour rainfall of 2.4 inches. Precipitation occurs an average of 90 days per year (0.01 inch or more). Precipitation data collected in Skull Valley indicate a range of annual precipitation of from 7 to 12 inches per year with increasing amounts at higher elevations in the Stansbury Mountains, maximizing at Deseret Peak with approximately 40 inches per year (Hood and Waddell, 1968). A 43-year record (1950 - 1992) of precipitation data at Dugway indicates a normal annual precipitation rate of 8.2 inches per year. An 8-year record (1951 - 1958) at Iosepa South Ranch indicates an average annual precipitation rate of 9.6 inches per year. The PFSF site data indicate annual precipitation amounts of 9.5 and 10.8 inches respectively for the years 1997 and 1998. Therefore, the valley location of the PFSF tends toward the lowest precipitation amounts in the area. Table 2.3-3 summarizes monthly precipitation amounts for Salt Lake City and Skull Valley locations, including the PFSF site.

The range of temperatures in the area is rather large from winter to summer. Summers are relatively hot with temperatures reaching 90°F or higher approximately 56 days per year on average at Salt Lake City. The average daily maximum temperature at Salt Lake City in July is 93.2°F, and mean maximum temperatures at Dugway and Iosepa South Ranch exceed 90°F during July and August. The record high temperature at Salt Lake City is 107°F occurring in July, 1960 with record high temperatures ranging from 105 to 109°F in Skull Valley. Winters are moderately cold with an average monthly temperature of 28.6°F in January at Salt Lake City and a daily minimum temperature of 19.7°F. The lowest recorded temperature at Salt Lake City is -30°F occurring in February 1933. Similar winter temperatures are experienced in Skull Valley with average monthly values near 30°F in December and January and record low temperatures from -11 to -29°F. The average number of days with temperatures reaching 32°F or below at Salt Lake City is 125 days with the first freeze normally occurring in October and the last freeze occurring in April. The annual average temperature at Salt Lake City is approximately 52°F for the period 1951 - 1980 with Skull Valley average temperatures ranging from 49 to 51°F. Table 2.3-4 provides daily maximum, daily minimum, and average temperatures by month for the period 1951 to 1980 for Salt Lake City, 1950 to 1992 for Dugway, and 1951 to 1958 for Iosepa South Ranch. These data are compared with the temperature data collected during the 2-year PFSF site meteorological monitoring program.

Winds at Salt Lake City are moderate and are fairly uniform over the year with the highest average speed (9.7 mph) occurring in August and the lightest average wind speed (7.4 mph) occurring in December. The long-term mean wind speed for the year is 8.8 mph. The prevailing wind direction at Salt Lake City is from the southeast or south-southeast throughout the year. The winds at the PFSF site based on the 2-year monitoring program are very similar to those of Salt Lake City. They are fairly uniform over the year with the highest monthly average speed (9.6 mph) occurring in April and the lightest monthly average wind speed (7.4 mph) occurring in November and December. The 2-year average wind speed at the PFSF site is 8.7 mph.

Table 2.3-5 provides mean wind speeds by month for a 62-year period of record and prevailing wind directions by month for Salt Lake City, along with the 2-year average values for the PFSF site. Long-term wind information is not available specifically for the other Skull Valley locations.

The PFSF site relative humidity values are summarized on a monthly average basis along with those for Salt Lake City in Table 2.3-11. The Salt Lake City data are the averages of four time-of-day values from NOAA, 1992, while the PFSF site values are based on hourly averages for a 2-year period. The table indicates that the relative humidity values, although for different time periods, are fairly similar to each other with the PFSF site values being somewhat higher during the spring and summer months. Relative humidity values are not available specifically for the other Skull Valley locations.

2. The 2-year site specific incoming solar radiation (insolation) data collected for the PFSF needs to be compared with data for a longer term (climatological) period as a demonstration of temporal representativeness.

## RESPONSE

The maximum total insolation for a 12-hour period recorded during the onsite meteorological monitoring program at the PFSF is  $706.5 \text{ g cal/cm}^2$  or  $684.6 \text{ watts/m}^2$  over a 12-hour period. In order to confirm the temporal representativeness of the on-site solar radiation data, this value is compared with long term solar radiation data available for Salt Lake City from the Solar and Meteorological Surface Observational Network (SAMSON) 3-volume CD-ROM set. It contains hourly solar radiation data along with selected meteorological elements for the period 1961-1990 which is the standard climatological period as defined by the World Meteorological Organization. The dataset includes both observational and modeled data. The hourly solar elements are: extraterrestrial horizontal and extraterrestrial direct normal radiation; global, diffuse, and direct normal radiation. The global horizontal radiation values were used in this comparison, as they represent the total amount of direct and diffuse solar radiation on a horizontal surface.

According to the National Climatic Data Center (NCDC) in Asheville, NC, the SAMSON database is the most reliable solar radiation data available for the area. The quality of other sources of solar radiation data in the area of PFSF cannot be confirmed by NCDC. Using the 30-year SAMSON database, the maximum total insolation for a 12-hour period was determined to

be 753.8 g cal/cm<sup>2</sup> or 730.4 watts/m<sup>2</sup> over a 12-hour period. Although these values are somewhat higher than those derived from the 2-year PFSF site data, they are comparable to the site data and clearly demonstrate that the design values of 800 g cal/cm<sup>2</sup> or 775 watts/m<sup>2</sup> over a 12-hour period from 10CFR71.71 are bounding.

References:

Hood, J. W. and Waddell, K. M., 1968, Hydrologic reconnaissance of Skull Valley, Tooele County, UT: Technical Publication No. 18, 57 pp.

NOAA (National Oceanic and Atmospheric Administration), 1992, Local climatological data, annual summary with comparative data for 1991: Salt Lake City, Utah National Environmental Satellite, Data, and Information Service, National Climatic Data Center.

National Climatic Data Center, U.S. Department of Commerce, "Solar and Meteorological Surface Observation Network, 1961 - 1990", Volume III, Western U.S., Version 1.0, September 1993.

PFS will include the above information on meteorology and insolation, as well as the attached tables, in the SAR update currently scheduled for issue during the first week of May 2000. If you have any questions regarding this response, please contact me at 303-741-7009.

Sincerely,



John L. Donnell  
Project Director  
Private Fuel Storage L.L.C.

Enclosure

Copy to (with enclosure):

Mark Delligatti  
John Parkyn  
Jay Silberg  
Sherwin Turk  
Asadul Chowdhury  
Greg Zimmerman  
Scott Northard  
Denise Chancellor  
Richard E. Condit  
John Paul Kennedy  
Joro Walker

**TABLE 2.3-3**

**NORMAL MONTHLY PRECIPITATION FOR SALT LAKE CITY,  
DUGWAY, IOSEPA SOUTH RANCH, AND PFSF**

<u>MONTH</u>	<u>PRECIPITATION (inches)</u>			
	<u>SALT LAKE CITY</u> <sup>1</sup>	<u>DUGWAY</u> <sup>2</sup>	<u>IOSEPA RANCH</u> <sup>3</sup>	<u>PSFS Site</u> <sup>4</sup>
January	1.35	0.46	0.97	0.42
February	1.33	0.57	0.59	0.48
March	1.72	0.84	1.05	0.37
April	2.21	0.81	1.44	0.93
May	1.47	1.06	1.26	0.72
June	0.97	0.53	0.64	3.16
July	0.72	0.57	0.47	1.23
August	0.92	0.61	0.63	0.60
September	0.89	0.72	0.15	0.96
October	1.14	0.81	0.65	0.74
November	1.22	0.58	0.82	0.20
December	1.37	0.59	0.98	0.38
Annual	15.31	8.15	9.64	10.16

1. Period of record for Salt Lake City is 1951 - 1980.
2. Period of record for Dugway is 1950 - 1992.
3. Period of record for Iosepa South Ranch is 1951 - 1958.
4. Period of record for PFSF Site is 12/96 – 12-98.

**TABLE 2.3-4**

**NORMAL MONTHLY TEMPERATURES (°F) FOR  
SALT LAKE CITY<sup>1</sup>, DUGWAY<sup>2</sup>, IOSEPA SOUTH RANCH,<sup>3</sup> AND PFSF<sup>4</sup>**

<u>MONTH</u>	<u>DAILY MAXIMUM</u>				<u>DAILY MINIMUM</u>				<u>AVERAGE</u>			
	<u>SLC</u>	<u>DUG</u>	<u>IOSEP</u>	<u>PFSF</u>	<u>SLC</u>	<u>DUG</u>	<u>IOSEP</u>	<u>PFSF</u>	<u>SLC</u>	<u>DUG</u>	<u>IOSEP</u>	<u>PFSF</u>
January	37	37	42	41	20	15	17	20	29	26	29	31
February	44	45	46	42	24	23	20	22	34	34	33	32
March	52	53	53	54	30	29	25	23	41	41	39	39
April	61	63	64	57	37	35	31	29	49	49	48	43
May	72	73	76	72	45	44	38	38	59	59	57	56
June	83	85	86	78	53	53	45	46	68	69	66	63
July	93	94	95	90	62	62	52	54	78	78	74	74
August	90	91	93	90	60	59	53	57	75	75	73	75
September	80	80	86	79	50	48	41	48	65	64	64	63
October	67	66	71	63	39	36	32	32	53	51	52	47
November	50	51	52	52	29	27	22	25	40	39	37	38
December	39	38	43	36	22	17	17	10	31	28	30	23

1. Period of record for Salt Lake City is 1951 - 1980.
2. Period of record for Dugway is 1950 - 1992.
3. Period of record for Iosepa South Ranch is 1951 - 1958.
4. Period of record for PFSF is 12/96 – 12/98.

TABLE 2.3-5

MEAN WIND SPEEDS AND PREVAILING DIRECTIONS FOR  
SALT LAKE CITY<sup>1</sup> AND PFSF<sup>2</sup>

<u>MONTH</u>	<u>WIND SPEED (MPH)</u>		<u>PREVAILING DIRECTION</u>	
	<u>Salt Lake City</u>	<u>PFSF Site</u>	<u>Salt Lake City</u>	<u>PFSF Site</u>
January	7.6	8.8	SSE	SE
February	8.2	9.1	SE	ESE
March	9.4	8.9	SSE	SE
April	9.6	9.6	SE	ESE
May	9.5	9.2	SE	SE
June	9.4	9.3	SSE	SE
July	9.6	8.5	SSE	SSE
August	9.7	9.1	SSE	SSE
September	9.1	8.2	SE	SSE
October	8.5	8.6	SE	SE
November	8.0	7.4	SSE	SE
December	7.4	7.4	SSE	SE

1. Period of record is 1951 - 1980.

2. Period of record is 12/96 – 12/98

**Table 2.3-11**

**AVERAGE RELATIVE HUMIDITY FOR SALT LAKE CITY<sup>1</sup> AND PFSF<sup>2</sup>**

<u>Month</u>	Relative Humidity (percent)	
	<u>Salt Lake City</u>	<u>PFSF Site</u>
January	74.3	74.2
February	69.3	74.3
March	59.0	61.3
April	52.8	61.5
May	48.5	52.4
June	41.3	51.7
July	35.8	40.0
August	38.0	39.5
September	44.8	56.7
October	54.0	60.1
November	66.0	67.5
December	74.5	75.5

1. Average of the four time-of-day relative humidity values for a 32-year period of record
2. Hourly average for the period of record of 12/96 – 12/98