Private Fuel Storage, LLC

P.O. Box C4010, La Crosse, WI 54602-4010
John D. Parkyn, Chairman of the Board

September 25, 2000

U.S. Nuclear Regulatory Commission
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Washington, D.C. 20555-0001

LICENSE APPLICATION AMENDMENT No. 19
DOCKET NO. 72-22/TAC NO. L22462
PRIVATE FUEL STORAGE FACILITY
PRIVATE FUEL STORAGE L.L.C.

Reference: Conference call between the NRC and Stone and Webster (S&W) dated September 21, 2000

This letter submits Amendment No. 19 to the Private Fuel Storage Facility (PFSF) License Application. This amendment revises Chapter 8 of the Safety Analysis Report (SAR) to provide additional details regarding the postulated spill of diesel fuel from the diesel locomotives located on the siding at the PFSF, as requested in the referenced conference call. Appendix C of the License Application has also been revised to add the latest PFS commitment resolution letters submitted to the NRC associated with the SAR and ER. Other miscellaneous changes have been made to the SAR, ER, and LA for clarity, accuracy and completeness.

If you have any questions regarding this submittal, please contact me at 608-787-1236 or Mr. J. L. Donnell, Project Director, at 303-741-7009.

Sincerely,

John D. Parkyn, Chairman
Private Fuel Storage L.L.C.

JDP:JRJ
Enclosure

NMSS01 Public

PREFACE

PRIVATE FUEL STORAGE FACILITY

LICENSE APPLICATION

AMENDMENT 18

Enclosed are the following revisions to the Private Fuel Storage Facility License Application documents:

Safety Analysis Report – Revision 18

Environmental Report – Revision 12

License Application – Revision 12

DOCUMENT CONTROL

PAGE	REVISION
Document Control Tab	
a	18
b	18
c	18
d	18
e	18
f	18
g	18
h	18
i	18
j	18
k	18
l	18
m	18
n	18
o	18
p	18
q	18
r	18
s	18
t	18
u	18
v	18
w	18
x	18
y	18
z	18
aa	18
Table of Contents Tab	
i	10
ii	0
iii	9
iv	13
Chapter 1 Tab	
1-i	0
1-ii	17
1.1-1	0
1.1-2	3
1.1-3	3
1.1-4	0
1.2-1	17
1.2-2	17

DOCUMENT CONTROL

PAGE	REVISION
1.3-1	17
1.3-2	17
1.3-3	17
1.3-4	0
1.4-1	17
1.4-2	4
1.5-1	17
1.5-2	0
1.6-1	17
1.6-2	0
1.7-1	17
1.7-2	17
Figure 1.1-1	3
Figure 1.1-2	2
Figure 1.2-1	3
Figure 1.3-1	12
Figure 1.3-2 (deleted)	17
Chapter 2 Tab	
2-i	13
2-ii	13
2-iii	12
2-iv	12
2-v	11
2-vi	11
2-vii	11
2-viii	12
2-ix	13
2-x	11
2-xi	11
2-xii	11
2-xiii	11
2-xiv	11
2.1-1	0
2.1-2	0
2.1-3	6
2.1-4	10
2.1-5	0
2.1-6	0
2.2-1	9
2.2-2	10
2.2-3	9
2.2-4	9
2.2-5	9

DOCUMENT CONTROL

PAGE	REVISION
2.2-6	16
2.2-7	16
2.2-8	16
2.2-9	16
2.2-10	16
2.2-11	16
2.2-12	16
2.2-13	16
2.2-14	16
2.2-15	16
2.2-16	16
2.2-17	16
2.2-18	13
2.2-19	13
2.2-20	16
2.2-21	16
2.2-22	13
2.2-23	13
2.2-24	13
2.3-1	0
2.3-2	0
2.3-3	0
2.3-4	0
2.3-5	0
2.3-6	0
2.3-7	0
2.3-8	0
2.3-9	0
2.3-10	0
2.3-11	0
2.3-12	12
2.3-13	12
2.3-14	12
2.3-15	12
2.3-16	12
2.3-17	12
2.3-18	12
2.3-19	12
2.3-20	12
2.3-21	12
2.3-22	12
2.4-1	0
2.4-2	0
2.4-3	3

DOCUMENT CONTROL

PAGE	REVISION
2.4-4	3
2.4-5	6
2.4-6	3
2.4-7	11
2.4-8	11
2.4-9	11
2.4-10	11
2.4-11	11
2.4-12	11
2.4-13	11
2.4-14	11
2.4-15	11
2.4-16	11
2.5-1	0
2.5-2	3
2.5-3	3
2.5-4	3
2.5-5	15
2.5-6	3
2.6-1	3
2.6-2	3
2.6-3	3
2.6-4	5
2.6-5	3
2.6-6	3
2.6-7	6
2.6-8	6
2.6-9	3
2.6-10	3
2.6-11	3
2.6-12	3
2.6-13	3
2.6-14	3
2.6-15	3
2.6-16	3
2.6-17	6
2.6-18	3
2.6-19	8
2.6-20	15
2.6-21	8
2.6-22	8
2.6-23	8
2.6-24	8
2.6-25	8

DOCUMENT CONTROL

PAGE	REVISION
2.6-26	8
2.6.26a	8
2.6.26b	8
2.6.26c	8
2.6.26d	8
2.6-27	9
2.6-28	9
2.6-29	15
2.6-30	9
2.6-31	11
2.6-32	13
2.6-33	13
2.6-34	13
2.6-35	13
2.6-36	13
2.6-36a	13
2.6-36b	13
2.6-36c	13
2.6-36d	13
2.6-36e	13
2.6-36f	13
2.6-37	13
2.6-38	9
2.6-39	11
2.6-40	11
2.6-41	11
2.6-42	11
2.6-43	11
2.6-44	11
2.6-44a	11
2.6-44b	11
2.6-44c	13
2.6-44d	13
2.6-45	9
2.6-46	13
2.6-47	13
2.6-48	9
2.6-49	13
2.6-50	17
2.6-51	11
2.6-52	9
2.6-53	9
2.6-54	9
2.6-55	13

DOCUMENT CONTROL

PAGE	REVISION
2.6-56	9
2.6-57	13
2.6-58	13
2.6-59	13
2.6-60	9
2.6-61	13
2.6-62	13
2.6-63	13
2.6-64	13
2.6-65	13
2.6-66	13
2.6-67	13
2.6-68	13
2.6-69	9
2.6-70	9
2.6-71	13
2.6-72	17
2.6-72a	17
2.6-72b	15
2.6-73	13
2.6-74	17
2.6-75	13
2.6-76	13
2.6-77	13
2.6-78	13
2.6-79	13
2.6-80	13
2.6-81	13
2.6-81a	13
2.6-81b	13
2.6-82	13
2.6-83	13
2.6-84	9
2.6-85	9
2.6-86	9
2.6-87	11
2.6-88	9
2.6-89	9
2.6-90	9
2.6-91	10
2.6-91a	11
2.6-91b	10
2.6-92	9
2.6-93	9

DOCUMENT CONTROL

PAGE	REVISION
2.6-94	9
2.6-95	9
2.6-96	9
2.6-97	9
2.6-98	13
2.6-99	11
2.6-100	11
2.6-100a	11
2.6-100b	11
2.6-101	9
2.6-102	9
2.6-103	9
2.6-104	9
2.6-105	9
2.6-106	9
2.6-107	9
2.6-108	13
2.6-109	13
2.6-110	9
2.6-111	13
2.6-112	13
2.6-113	11
2.6-114	11
2.6-115	11
2.6-116	9
2.7-1	11
2.7-2	5
2.8-1	11
2.8-2	11
2.8-3	11
2.8-4	11
2.8-5	11
2.8-6	11
2.8-7	12
2.8-8	16
2.8-9	12
2.8-10	17
2.8-11	17
2.8-12	15
2.8-13	15
2.8-14	11
Table 2.3-1	0
Table 2.3-2	0
Table 2.3-3	12

DOCUMENT CONTROL

PAGE	REVISION
Table 2.3-4	12
Table 2.3-5	12
Table 2.3-6	0
Table 2.3-7	0
Table 2.3-8	1
Table 2.3-9	0
Table 2.3-10	0
Table 2.3-11	12
Table 2.6-1	6
Table 2.6-2	6
Table 2.6-3	6
Table 2.6-4 (1 of 14)	0
Table 2.6-4 (2 of 14)	0
Table 2.6-4 (3 of 14)	0
Table 2.6-4 (4 of 14)	0
Table 2.6-4 (5 of 14)	0
Table 2.6-4 (6 of 14)	0
Table 2.6-4 (7 of 14)	0
Table 2.6-4 (8 of 14)	0
Table 2.6-4 (9 of 14)	0
Table 2.6-4 (10 of 14)	0
Table 2.6-4 (11 of 14)	0
Table 2.6-4 (12 of 14)	0
Table 2.6-4 (13 of 14)	0
Table 2.6-4 (14 of 14)	0
Table 2.6-5	6
Table 2.6-6	13
Table 2.6-7	13
Table 2.6-8	13
Table 2.6-9	13
Table 2.6-10	13
Table 2.6-11	13
Table 2.6-12	11
Table 2.6-13	13
Figure 2.1-1	0
Figure 2.1-2 (1 of 2)	3
Figure 2.1-2 (2 of 2)	0
Figure 2.3-1	0
Figure 2.3-2	0
Figure 2.3-3	0
Figure 2.3-4	0
Figure 2.3-5	0
Figure 2.3-6	0
Figure 2.4-1	3

DOCUMENT CONTROL

PAGE	REVISION
Figure 2.4-2	3
Figure 2.4-3	3
Figure 2.4-4	3
Figure 2.4-5	3
Figure 2.5-1	3
Figure 2.6-1	0
Figure 2.6-2 (1 of 2)	8
Figure 2.6-2 (2 of 2)	0
Figure 2.6-3	0
Figure 2.6-4	0
Figure 2.6-5 (1 of 14)	8
Figure 2.6-5 (2 of 14)	8
Figure 2.6-5 (3 of 14)	8
Figure 2.6-5 (4 of 14)	8
Figure 2.6-5 (5 of 14)	8
Figure 2.6-5 (6 of 14)	8
Figure 2.6-5 (7 of 14)	8
Figure 2.6-5 (8 of 14)	8
Figure 2.6-5 (9 of 14)	8
Figure 2.6-5 (10 of 14)	8
Figure 2.6-5 (11 of 14)	8
Figure 2.6-5 (12 of 14)	8
Figure 2.6-5 (13 of 14)	8
Figure 2.6-5 (14 of 14)	8
Figure 2.6-6	0
Figure 2.6-7	0
Figure 2.6-8	0
Figure 2.6-9	0
Figure 2.6-10	0
Figure 2.6-11	0
Figure 2.6-12	0
Figure 2.6-13A	6
Figure 2.6-13B	6
Figure 2.6-13C	6
Figure 2.6-14A	6
Figure 2.6-14B	6
Figure 2.6-14C	6
Figure 2.6-15	0
Figure 2.6-16	0
Figure 2.6-17	6
Figure 2.6-18	6
Figure 2.6-19	8
Figure 2.6-20 (1 of 2)	6
Figure 2.6-20 (2 of 2)	6

DOCUMENT CONTROL

PAGE	REVISION
Figure 2.6-21	6
Figure 2.6-22	6
Figure 2.6-23	6
Figure 2.6-24	6
Figure 2.6-25	11
Figure 2.6-26	6
Figure 2.6-27	6
Figure 2.6-28	6
Figure 2.6-29	6
Figure 2.6-30 (1 of 6)	8
Figure 2.6-30 (2 of 6)	8
Figure 2.6-30 (3 of 6)	8
Figure 2.6-30 (4 of 6)	8
Figure 2.6-30 (5 of 6)	8
Figure 2.6-30 (6 of 6)	8
Figure 2.6-31	11
Appendix 2A Tab	
Reports	8
Appendix 2B Tab	
Survey	0
Appendix 2C Tab	
Analysis	0
Appendix 2D Tab	
Deleted	3
Appendix 2E Tab	
Analysis	0
Appendix 2F Tab	
Report	9
Appendix 2G Tab	

DOCUMENT CONTROL

PAGE	REVISION
Evaluation	10
Chapter 3 Tab	
3-i	9
3-ii	17
3-iii	17
3-iv	17
3-v	17
3-vi	0
3.1-1	17
3.1-2	17
3.1-3	17
3.1-4	17
3.1-5	17
3.1-6	0
3.2-1	0
3.2-2	17
3.2-3	17
3.2-4	1
3.2-5	9
3.2-5a	9
3.2-5b	9
3.2-6	0
3.2-7	17
3.2-8	9
3.2-8a	9
3.2-8b	9
3.2-9	7
3.2-10	5
3.2-11	5
3.2-12	17
3.2-13	17
3.2-14	9
3.2-14a	3
3.2-14b	3
3.2-15	17
3.2-16	17
3.2-17	0
3.2-18	1
3.2-19	17
3.2-20	17
3.2-21	17
3.2-22	17

DOCUMENT CONTROL

PAGE	REVISION
3.2-23	17
3.2-24	17
3.2-24a	12
3.2-24b	12
3.2-25	5
3.2-26	1
3.2-27	1
3.2-28	1
3.2-29	1
3.2-30	1
3.2-31	1
3.2-32	1
3.3-1	17
3.3-2	17
3.3-3	17
3.3-4	17
3.3-5	12
3.3-6	1
3.3-7	13
3.3-8	13
3.3-9	13
3.3-10	10
3.3-11	10
3.3-12	10
3.4-1	0
3.4-2	17
3.4-3	17
3.4-4	9
3.4-5	9
3.4-6	17
3.4-7	17
3.4-8	9
3.5-1	0
3.5-2	17
3.6-1	0
3.6-2	0
3.7-1	17
3.7-2	0
3.7-3	12
3.7-4	12
Table 3.1-1 (deleted)	12
Table 3.1-2 (deleted)	12
Table 3.1-3 (1 of 2, deleted)	17
Table 3.1-3 (2 of 2) (deleted)	17

DOCUMENT CONTROL

PAGE	REVISION
Table 3.2-1	12
Table 3.2-2	12
Table 3.2-3 (deleted)	17
Table 3.4-1	17
Table 3.6-1 (1 of 5)	17
Table 3.6-1 (2 of 5)	13
Table 3.6-1 (3 of 5)	17
Table 3.6-1 (4 of 5)	17
Table 3.6-1 (5 of 5)	17
Chapter 4 Tab	
4-i	4
4-ii	17
4-iii	10
4-iv	17
4-v	9
4-vi	17
4-vii	17
4-viii	17
4-ix	17
4-x	17
4.1-1	17
4.1-2	17
4.1-3	0
4.1-4	16
4.2-1	17
4.2-2	0
4.2-3	12
4.2-4	12
4.2-5	12
4.2-6	12
4.2-7	12
4.2-8	13
4.2-9	12
4.2-10	12
4.2-11	12
4.2-12	4
4.2-13	1
4.2-14	12
4.2-15	12
4.2-16	17
4.2-16a	7
4.2-16b	12
4.2-16c	10

DOCUMENT CONTROL

PAGE	REVISION
4.2-16d	7
4.2-17	8
4.2-18	12
4.2-19	12
4.2-20	12
4.2-20a	12
4.2-20b	12
4.2-21	4
4.2-22	17
4.2-23	17
4.2-24	17
4.2-25	17
4.2-26	17
4.2-27	17
4.2-28	17
4.2-29	17
4.2-30	17
4.2-31	17
4.2-32	17
4.2-33	17
4.2-34	17
4.3-1	9
4.3-2	9
4.3-3	12
4.3-4	13
4.3-5	13
4.3-6	9
4.3-7	10
4.3-8	13
4.3-9	13
4.3-10	10
4.3-11	10
4.3-12	16
4.3-13	10
4.3-14	16
4.3-15	16
4.3-16	10
4.3-17	10
4.3-18	10
4.3-19	16
4.3-20	13
4.3-21	13
4.3-22	10
4.4-1	0

DOCUMENT CONTROL

PAGE	REVISION
4.4-2	0
4.5-1	17
4.5-2	17
4.5-3	17
4.5-4	8
4.5-5	17
4.5-6	17
4.6-1	0
4.6-2	0
4.7-1	17
4.7-2	13
4.7-3	15
4.7-4	0
4.7-5	6
4.7-6	15
4.7-6a	13
4.7-6b	9
4.7-6c	9
4.7-6d	17
4.7-6e	18
4.7-6f	9
4.7-7	9
4.7-8	9
4.7-8a	13
4.7-8b	15
4.7-8c	9
4.7-8d	9
4.7-8e	17
4.7-8f	17
4.7-8g	15
4.7-8h	15
4.7-8i	15
4.7-8j	13
4.7-9	3
4.7-10	2
4.7-11	3
4.7-12	17
4.7-12a	17
4.7-12b	17
4.7-13	17
4.7-13a	13
4.7-13b	13
4.7-13c	6
4.7-13d	6

DOCUMENT CONTROL

PAGE	REVISION
4.7-13e	6
4.7-13f	6
4.7-13g	6
4.7-13h	6
4.7-13i	9
4.7-13j	6
4.7-14	0
4.7-15	12
4.7-16	0
4.7-17	12
4.7-18	0
4.7-19	12
4.7-20	12
4.7-21	12
4.7-22	12
4.7-23	17
4.7-24	17
4.7-25	17
4.7-26	17
4.8-1	17
4.8-2	17
4.8-3	16
4.8-4	9
4.8-5	6
4.8-6	15
4.8-7	6
4.8-8	17
4.8-9	13
4.8-10	16
Table 4.1-1 (1 of 7)	17
Table 4.1-1 (2 of 7)	17
Table 4.1-1 (3 of 7)	17
Table 4.1-1 (4 of 7)	17
Table 4.1-1 (5 of 7)	17
Table 4.1-1 (6 of 7)	0
Table 4.1-1 (7 of 7)	0
Table 4.2-1	7
Table 4.2-2	12
Table 4.2-3	12
Table 4.2-4 (deleted)	17
Table 4.2-5 (deleted)	17
Table 4.2-6 (deleted)	17
Table 4.2-7	13
Table 4.2-8	9

DOCUMENT CONTROL

PAGE	REVISION
Table 4.7-1	12
Table 4.7-2	4
Table 4.7-3 (deleted)	17
Figure 4.1-1	2
Figure 4.1-2	0
Figure 4.1-3	0
Figure 4.1-4	0
Figure 4.2-1	12
Figure 4.2-2 (1 of 3)	12
Figure 4.2-2 (2 of 3)	12
Figure 4.2-2 (3 of 3)	12
Figure 4.2-3	12
Figure 4.2-4 (deleted)	17
Figure 4.2-5 (1 of 4) (deleted)	17
Figure 4.2-5 (2 of 4) (deleted)	17
Figure 4.2-5 (3 of 4) (deleted)	17
Figure 4.2-5 (4 of 4) (deleted)	17
Figure 4.2-6 (deleted)	17
Figure 4.2-7	8
Figure 4.2-8	0
Figure 4.3-1	11
Figure 4.5-1 (1 of 2)	12
Figure 4.5-1 (2 of 2)	12
Figure 4.5-2 (deleted)	17
Figure 4.5-3 (1 of 2)	11
Figure 4.5-3 (2 of 2)	2
Figure 4.5-4	17
Figure 4.5-5	17
Figure 4.5-6 (1 of 4)	3
Figure 4.5-6 (2 of 4)	3
Figure 4.5-6 (3 of 4)	3
Figure 4.5-6 (4 of 4)	3
Figure 4.7-1 (1 of 3)	11
Figure 4.7-1 (2 of 3)	2
Figure 4.7-1 (3 of 3)	11
Figure 4.7-2	0
Figure 4.7-3 (deleted)	17
Figure 4.7-4	0
Figure 4.7-5	3
Figure 4.7-6	3
Figure 4.7-7	6
Figure 4.7-8	11

DOCUMENT CONTROL

PAGE	REVISION
5-i	0
5-ii	7
5-iii	0
5-iv	17
5-v	17
5-vi	0
5.1-1	17
5.1-2	0
5.1-3	3
5.1-4	2
5.1-5	17
5.1-6	17
5.1-7	13
5.1-8	17
5.1-9	17
5.1-10	13
5.2-1	17
5.2-2	17
5.2-3	17
5.2-4	17
5.2-5	17
5.2-6	17
5.3-1	0
5.3-2	0
5.4-1	0
5.4-2	0
5.5-1	1
5.5-2	0
5.6-1	0
5.6-2	0
5.7-1	17
5.7-2	0
Table 5.1-1 (1 of 2)	6
Table 5.1-1 (2 of 2)	6
Table 5.1-2 (1 of 2) (deleted)	17
Table 5.1-2 (2 of 2) (deleted)	17
Figure 5.1-1	1
Figure 5.1-2	0
Figure 5.1-3 (deleted)	17
Figure 5.1-4 (deleted)	17
Figure 5.1-5	0

DOCUMENT CONTROL

PAGE	REVISION
6-i	0
6-ii	0
6.1-1	17
6-1-2	13
6.2-1	1
6.2-2	0
6.3-1	0
6.3-2	0
6.4-1	17
6.4-2	7
6.4-3	7
6.4-4	7
6.5-1	13
6.5-2	0
6.6-1	17
6.6-2	0
Chapter 7 Tab	
7-i	17
7-ii	17
7-iii	17
7-iv	17
7-v	0
7-vi	0
7.1-1	0
7.1-2	0
7.1-3	0
7.1-4	0
7.1-5	17
7.1-6	0
7.1-7	0
7.1-8	13
7.1-9	3
7.1-10	3
7.1-11	3
7.1-12	3
7.2-1	17
7.2-2	17
7.2-3	17
7.2-4	17
7.2-5	17
7.2-6	17
7.3-1	0
7.3-2	0

DOCUMENT CONTROL

PAGE	REVISION
7.3-3	9
7.3-3a	13
7.3-3b	13
7.3-4	17
7.3-5	17
7.3-6	17
7.3-7	17
7.3-8	17
7.3-9	17
7.3-10	17
7.3-11	17
7.3-12	17
7.3-13	17
7.3-14	17
7.3-15	17
7.3-16	17
7.4-1	17
7.4-2	17
7.4-3	17
7.4-4	12
7.5-1	3
7.5-2	0
7.5-3	8
7.5-4	8
7.5-5	8
7.5-6	8
7.5-7	8
7.5-8	8
7.6-1	17
7.6-2	0
7.6-3	13
7.6-4	13
7.7-1	17
7.7-2	17
7.7-3	10
7.7-4	17
Table 7.3-1	10
Table 7.3-2 (deleted)	17
Table 7.3-3	10
Table 7.3-4 (deleted)	17
Table 7.3-5	10
Table 7.3-6	17
Table 7.3-7	10
Table 7.3-8	17

DOCUMENT CONTROL

PAGE	REVISION
Table 7.4-1 (1 of 4)	10
Table 7.4-1 (2 of 4)	10
Table 7.4-1 (3 of 4)	10
Table 7.4-1 (4 of 4)	10
Table 7.4-2 (1 of 4) (deleted)	17
Table 7.4-2 (2 of 4) (deleted)	17
Table 7.4-2 (3 of 4) (deleted)	17
Table 7.4-2 (4 of 4) (deleted)	17
Figure 7.3-1	0
Figure 7.3-2	17
Chapter 8 Tab	
8-i	0
8-ii	7
8-iii	16
8-iv	9
8-v	9
8-vi	13
8.1-1	9
8.1-2	17
8.1-3	0
8.1-4	17
8.1-5	17
8.1-6	17
8.1-7	7
8.1-8	17
8.1-9	17
8.1-10	17
8.1-11	0
8.1-12	17
8.1-13	17
8.1-14	17
8.1-15	17
8.1-16	17
8.1-17	13
8.1-18	17
8.1-19	7
8.1-20	7
8.2-1	9
8.2-2	3
8.2-3	17
8.2-4	17
8.2-5	17
8.2-6	7

DOCUMENT CONTROL

PAGE	REVISION
8.2-7	7
8.2-8	17
8.2-9	17
8.2-10	17
8.2-11	7
8.2-12	17
8.2-13	3
8.2-14	17
8.2-15	17
8.2-15a	17
8.2-15b	17
8.2-16	17
8.2-17	17
8.2-18	17
8.2-19	17
8.2-20	17
8.2-21	10
8.2-22	13
8.2-23	11
8.2-23a	17
8.2-23b	13
8.2-23c	17
8.2-23d	11
8.2-23e	11
8.2-23f	13
8.2-23g	13
8.2-23h	13
8.2-23i	14
8.2-23j	13
8.2-23k	14
8.2-23l	14
8.2-23m	14
8.2-23n	14
8.2-23o	14
8.2-23p	16
8.2-23q	16
8.2-23r	16
8.2-24	13
8.2-25	13
8.2-26	11
8.2-27	11
8.2-28	13
8.2-29	17
8.2-29a	17

DOCUMENT CONTROL

PAGE	REVISION
8.2-29b	17
8.2-29c	17
8.2-29d	11
8.2-29e	17
8.2-29f	18
8.2-29g	18
8.2-29g1	18
8.2-29g2	18
8.2-29h	11
8.2-29i	11
8.2-29j	11
8.2-29k	11
8.2-29l	11
8.2-29m	13
8.2-29n	17
8.2-29o	17
8.2-29p	13
8.2-29q	17
8.2-29r	11
8.2-30	17
8.2-31	17
8.2-32	13
8.2-32a	17
8.2-32b	17
8.2-32c	17
8.2-32d	17
8.2-32e	17
8.2-32f	16
8.2-32g	16
8.2-32h	16
8.2-33	17
8.2-34	17
8.2-35	17
8.2-36	17
8.2-37	17
8.2-38	17
8.2-39	17
8.2-40	17
8.2-41	17
8.2-42	17
8.2-43	13
8.2-44	17
8.2-45	17
8.2-46	17

DOCUMENT CONTROL

PAGE	REVISION
8.2-47	17
8.2-48	17
8.2-49	7
8.2-50	17
8.2-51	17
8.2-52	9
8.3-1	7
8.3-2	7
8.4-1	17
8.4-2	17
8.4-3	9
8.4-4	9
8.4-5	9
8.4-6	9
8.4-7	17
8.4-8	17
8.4-9	9
8.4-10	13
8.4-11	17
8.4-12	10
8.5-1	17
8.5-2	9
8.5-3	17
8.5-4	9
8.5-5	9
8.5-6	10
8.5-7	17
8.5-8	17
8.5-9	13
8.5-10	17
Table 8.1-1	17
Table 8.1-2	17
Table 8.2-1	17
Figure 8.2-1	15
Chapter 9 Tab	
9-i	0
9-ii	1
9-iii	4
9-iv	4
9-v	0
9-vi	0
9.1-1	0
9.1-2	0

DOCUMENT CONTROL

PAGE	REVISION
9.1-3	0
9.1-4	4
9.1-5	4
9.1-6	4
9.1-7	4
9.1-8	4
9.1-9	4
9.1-10	13
9.1-10a	13
9.1-10b	13
9.1-10c	13
9.1-10d	13
9.1-11	13
9.1-12	4
9.1-13	13
9.1-14	0
9.1-15	1
9.1-16	1
9.1-16a	1
9.1-16b	1
9.1-17	0
9.1-18	0
9.1-19	0
9.1-20	0
9.1-21	0
9.1-22	0
9.1-23	0
9.1-24	3
9.1-25	4
9.1-26	4
9.1-27	4
9.1-28	4
9.1-29	4
9.1-30	4
9.2-1	13
9.2-2	13
9.2-2a	1
9.2-2b	1
9.2-3	17
9.2-4	17
9.2-5	0
9.2-6	0
9.2-7	1
9.2-8	1

DOCUMENT CONTROL

PAGE	REVISION
9.2-8a	17
9.2-8b	1
9.3-1	4
9.3-2	4
9.3-3	13
9.3-4	4
9.3-5	4
9.3-6	4
9.3-7	4
9.3-8	4
9.4-1	3
9.4-2	4
9.4-2a	4
9.4-2b	4
9.4-3	3
9.4-4	3
9.4-5	3
9.4-6	3
9.4-7	3
9.4-8	3
9.5-1	0
9.5-2	13
9.5-3	0
9.5-4	0
9.6-1	0
9.6-2	0
9.7-1	0
9.7-2	0
9.7-3	0
9.7-4	0
Figure 9.1-1	4
Figure 9.1-2	4
Figure 9.1-3	12
Chapter 10 Tab	
10-i	13
10-ii	13
10.1-1	13
10.1-2	13
Appendix 10A Tab	
Technical Specification Bases	13

DOCUMENT CONTROL

PAGE	REVISION
Chapter 11 Tab	
11-i	0
11-ii	0
11.1-1	4
11.1-2	4
11.1-3	4
11.1-4	0
11.1-5	0
11.1-6	0
11.1-7	0
11.1-8	0
11.1-9	0
11.1-10	0
11.2-1	0
11.2-2	0

The overall seismic analysis of the building and foundation does not specifically include the additional weight of the shipping casks, transfer casks, and storage casks. However, an allowance of 5 percent of the mass of the mat was included in the lumped mass model to account for miscellaneous equipment and minor structural elements not discretely included in the mass calculations. The heaviest cask is a loaded concrete storage cask with a maximum weight of approximately 177 tons (Section 4.7.2.5.1). Although the loaded concrete storage casks are very heavy, each would equal only about 0.5 percent of the total mass of the structure. In addition, the casks will be located directly on the mat foundation and will have very little effect on the seismic response of the building itself.

The Canister Transfer Building is provided with three bays that are used for canister transfer operations. Shipping casks containing canisters will be moved immediately from the heavy haul tractor-trailer or rail car to the canister transfer bays. If the canister transfer bays are in-use, a maximum of two loaded shipping casks can be parked in the rail bays. Therefore, the maximum number of loaded casks within the entire building would be five at any one time (3 storage and 2 shipping). Empty shipping casks will be returned immediately or stored on the trailer or rail car outside of the Canister Transfer Building. There will be a maximum of four metal transfer casks, but their weight is relatively insignificant when not loaded.

For the design of the mat foundation, two worst-case load combinations were investigated. These are described in Section 4.7.1.5.3. Ground floor live loads (i.e., casks at various locations) were neglected in both of the load combinations considered. This is conservative because the maximum bending moments in the mat foundation occur at the intersection with the exterior walls, and are positive (tension on bottom face). The bending moments in the mat foundation away from the walls are negative (tension on top face). Application of live loads, including the weight of the casks, will

result in bending moments that counteract the bending moments from these other critical load cases. Therefore, it is conservative to omit these loads in the analysis of the Canister Transfer Building mat foundation for the two load combinations considered. A calculation describing the mat foundation loading cases and designs is contained in Reference 46.

Crane loads will be increased to account for lateral and longitudinal impact forces.

3.62 minutes for the 50 gallons of diesel fuel encircling the storage cask, an integrated incident radiant heat flux of 1304 Btu / ft^2 was calculated. This compares with the following integrated incident radiant heat fluxes from the three postulated locomotive fuel fires:

Dia. = 50 ft Integrated Incident Radiant Heat Flux = 592 Btu / ft^2
Dia. = 75 ft Integrated Incident Radiant Heat Flux = 435 Btu / ft^2
Dia. = 100 ft Integrated Incident Radiant Heat Flux = 405 Btu / ft^2

These integrated incident radiant heat fluxes are all less than half of that associated with the fire analyzed in Section 11.2.4 of the HI-STORM SAR (1304 Btu / ft^2). Based on radiant heat input alone, it is seen that the thermal effects of the fire analyzed in the HI-STORM Storage Cask SAR would bound those associated with the postulated locomotive diesel fuel fires. In addition to the radiant heat input from the fire analyzed in the HI-STORM Storage Cask SAR, there is also substantial heat input to the storage cask from convection since the fire is assumed to encircle the cask with movement of hot gases impinging on the sides of the cask. In the case of the locomotive fuel fires, convective heat transfer is judged to be negligible due to distances from the edge of the postulated fires to the storage casks (minimum of 60 ft). Therefore, it is concluded that the thermal effects on a storage cask from the fire analyzed in Section 11.2.4 of the HI-STORM Storage Cask SAR bound those that could occur from worst case fires associated with diesel fuel spilled from locomotives at the PFSF.

The land contour of the PFSF site has a downward slope from the rail lines to the cask storage area. This slope will direct storm water run-off to the detention basin on the north side of the storage facility. In order to prevent diesel fuel spilled from locomotives from flowing toward the cask storage area, an intervening drainage swale will be constructed that runs in the east-west direction parallel to and on the north side of the rail siding. The nearest edge of the swale will be approximately 10 ft from the rail

siding. The north edge of the swale (closest to the storage pads) would be further than 60 ft away from the nearest storage pads. Diesel fuel spilled from leaking or ruptured locomotive fuel tanks on the north side of the rail siding would therefore drain into this swale. Since locomotives at the PFSF will be operating at slow speeds associated with switching and siding operations (approximately 5 to 10 mph), it would be highly improbable that a locomotive would derail. Further, there is no credible mechanism for a locomotive to tip over even if a derailment occurred at these low speeds. However, the swale will be designed to assure that in the unlikely event of a complete loss of fuel from a locomotive the diesel fuel will drain into the swale and be contained there away from the cask storage area, even if a locomotive were postulated to derail and tip over. The capacity of this swale will be sufficient to contain a total loss of diesel fuel coincident with a 100 year design rainfall. Based on the above, it is concluded that the storage casks would retain their integrity and there would be no release of radioactivity from storage casks, even in the highly unlikely event of a diesel fuel fire associated with locomotives.

Canister Transfer Building

A fire in the Canister Transfer Building would have a negligible effect on storage casks on the storage pads because of the concrete construction of the building walls and the distance between the Canister Transfer Building and the storage pads. The Canister Transfer Building is approximately 425 ft from the nearest storage pad.

The Canister Transfer Building contains minimal combustible loading, except when a heavy haul tractor/trailer or cask transporter is present in the building. Transient combustibles associated with these vehicles are up to 300 gallons of diesel fuel inside the saddle tanks of the heavy haul tractor and the rubber tires associated with the heavy haul tractor and trailer, and up to 50 gallons of diesel fuel inside the fuel tank of the cask transporter. In the event of rail delivery/retrieval of shipping casks, locomotives are required by administrative procedure to stay out of the Canister

Transfer Building and rail stops are installed to physically prevent locomotive entry, as discussed above. Although it is highly unlikely that the fuel tank of a heavy haul tractor could rupture and spilled diesel fuel ignite, the design of the Canister Transfer Building includes provisions to address scenarios associated with such an occurrence, as discussed below.

The postulated fire scenarios in the Canister Transfer Building cask load/unload bay are assumed to involve 300 gallons of diesel fuel from ruptured fuel tanks of a heavy haul tractor and/or the heavy haul vehicle tires. The heavy haul vehicles enter and exit the cask load/unload bay at the south end of the Canister Transfer Building and do not

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DOCUMENT CONTROL

PAGE	REVISION
Document Control Tab	
a	12
b	12
c	12
d	12
e	12
f	12
g	12
h	12
i	12
j	12
k	12
l	12
m	12
n	12
o	12
p	12
q	12
r	12
Table of Contents Tab	
i	0
ii	6
iii	8
iv	3
Chapter 1 Tab	
1-i	0
1-ii	0
1.1-1	1
1.1-2	0
1.2-1	1
1.2-2	6
1.2-3	12
1.2-4	6
1.2-5	6
1.2-6	6
1.2-7	11
1.2-8	6
1.2-9	6
1.2-10	6
1.3-1	1
1.3-2	9
1.4-1	6

DOCUMENT CONTROL

PAGE	REVISION
1.4-2	0
Chapter 2 Tab	
2-i	6
2-ii	6
2-iii	2
2-iv	7
2-v	6
2-vi	0
2-vii	2
2-viii	6
2-ix	6
2-x	6
2-xi	5
2-xii	5
2.1-1	0
2.1-2	1
2.1-3	7
2.1-4	7
2.2-1	0
2.2-2	2
2.2-3	6
2.2-4	6
2.2-5	6
2.2-6	6
2.2-7	6
2.2-8	6
2.2-9	6
2.2-10	6
2.3-1	2
2.3-2	6
2.3-2a	6
2.3-2b	6
2.3-3	1
2.3-4	1
2.3-5	1
2.3-6	1
2.3-7	1
2.3-8	6
2.3-9	6
2.3-10	6
2.3-11	6
2.3-11a	6
2.3-11b	6

DOCUMENT CONTROL

PAGE	REVISION
2.3-12	1
2.3-13	1
2.3-14	1
2.3-15	1
2.3-16	1
2.3-17	1
2.3-18	5
2.3-19	1
2.3-20	1
2.3-21	1
2.3-22	1
2.3-23	1
2.3-24	6
2.3-25	6
2.3-26	6
2.3-27	6
2.3-28	6
2.3-29	1
2.3-30	1
2.3-31	6
2.3-32	6
2.3-33	6
2.3-34	6
2.3-35	6
2.3-36	6
2.3-37	6
2.3-38	6
2.4-1	0
2.4-2	0
2.4-3	0
2.4-4	0
2.4-5	0
2.4-6	0
2.4-7	0
2.4-8	0
2.4-9	1
2.4-10	1
2.4-11	0
2.4-12	2
2.4-13	8
2.4-14	8
2.4-15	8
2.4-16	2
2.4-17	6

DOCUMENT CONTROL

PAGE	REVISION
2.4-18	6
2.5-1	0
2.5-2	1
2.5-3	2
2.5-4	2
2.5-5	2
2.5-6	2
2.5-7	2
2.5-8	2
2.5-9	2
2.5-10	2
2.5-11	2
2.5-12	10
2.6-1	2
2.6-2	4
2.6-3	2
2.6-4	2
2.6-5	2
2.6-6	2
2.6-7	2
2.6-8	2
2.6-9	2
2.6-10	6
2.6-11	2
2.6-12	7
2.6-13	10
2.6-14	6
2.6-15	7
2.6-16	9
2.6-17	9
2.6.17a	9
2.6.17b	7
2.6-18	6
2.6-19	5
2.6-20	5
2.6-21	5
2.6-22	5
2.6-23	5
2.6-24	5
2.6.25	5
2.6.26	5
2.6-27	5
2.6-28	5
2.6-29	7

DOCUMENT CONTROL

PAGE	REVISION
2.6-30	7
2.6-31	7
2.6-32	7
2.7-1	6
2.7-2	6
2.7-3	6
2.7-4	6
2.7-5	6
2.7-6	6
2.7-7	6
2.7-8	6
2.7-9	6
2.7-10	6
2.7-11	6
2.7-12	6
2.7-13	6
2.7-14	6
2.7-15	6
2.7-16	6
2.7-17	6
2.7-18	6
2.8-1	7
2.8-2	6
2.8-3	6
2.8-4	6
2.8-5	6
2.8-6	6
2.9-1	6
2.9-2	6
2.9-3	6
2.9-4	6
2.9-5	6
2.9-6	6
2.10-1	7
2.10-2	6
2.10-3	6
2.10-4	6
2.11-1	0
2.11-2	6
2.11-3	6
2.11-4	6
2.11-5	6
2.11-6	6
2.11-7	6

DOCUMENT CONTROL

PAGE	REVISION
2.11-8	6
2.11-9	6
2.11-10	9
2.11-11	9
2.11-12	6
Table 2.2-1	0
Table 2.3-1	0
Table 2.3-2 (1 of 5)	2
Table 2.3-2 (2 of 5)	2
Table 2.3-2 (3 of 5)	2
Table 2.3-2 (4 of 5)	2
Table 2.3-2 (5 of 5)	1
Table 2.3-3	1
Table 2.4-1	0
Table 2.4-2	0
Table 2.4-3	2
Table 2.4-4	8
Table 2.4-5	2
Table 2.4-6	2
Table 2.4-7	2
Table 2.4-8	2
Table 2.4-9	2
Table 2.4-10	2
Table 2.4-11 (1 of 2)	6
Table 2.4-11 (2 of 2)	6
Table 2.4-12 (1 of 8)	6
Table 2.4-12 (2 of 8)	6
Table 2.4-12 (3 of 8)	6
Table 2.4-12 (4 of 8	6
Table 2.4-12 (5 of 8)	6
Table 2.4-12 (6 of 8)	6
Table 2.4-12 (7 of 8)	6
Table 2.4-12 (8 of 8)	6
Table 2.6-1A	5
Table 2.6-1B	5
Table 2.6-1C	5
Table 2.6-2 (1 of 14)	0
Table 2.6-2 (2 of 14)	0
Table 2.6-2 (3 of 14)	0
Table 2.6-2 (4 of 14)	0
Table 2.6-2 (5 of 14)	0
Table 2.6-2 (6 of 14)	0
Table 2.6-2 (7 of 14)	0
Table 2.6-2 (8 of 14)	0

DOCUMENT CONTROL

PAGE	REVISION
Table 2.6-2 (9 of 14)	0
Table 2.6-2 (10 of 14)	0
Table 2.6-2 (11 of 14)	0
Table 2.6-2 (12 of 14)	0
Table 2.6-2 (13 of 14)	0
Table 2.6-2 (14 of 14)	0
Table 2.7-1	0
Table 2.7-2	0
Table 2.7-3	0
Table 2.8-1 (1 of 3)	1
Table 2.8-1 (2 of 3)	1
Table 2.8-1 (3 of 3)	1
Table 2.8-2	6
Figure 2.1-1	2
Figure 2.1-2 (1 of 2)	2
Figure 2.1-2 (2 of 2)	0
Figure 2.2-1	0
Figure 2.2-2	0
Figure 2.2-3	0
Figure 2.2-4	0
Figure 2.3-1	0
Figure 2.3-2	0
Figure 2.3-3	0
Figure 2.3-4	0
Figure 2.3-5	0
Figure 2.3-6	0
Figure 2.3-7	0
Figure 2.3-8	0
Figure 2.3-9	0
Figure 2.3-10	0
Figure 2.3-11	0
Figure 2.3-12	0
Figure 2.3-13	6
Figure 2.3-14	6
Figure 2.3-15	6
Figure 2.4-1	0
Figure 2.4-2	0
Figure 2.4-3	0
Figure 2.4-4	0
Figure 2.4-5	0
Figure 2.5-1	2
Figure 2.5-2	2
Figure 2.6-1	0
Figure 2.6-2 (1 of 2)	5

DOCUMENT CONTROL

PAGE	REVISION
Figure 2.6-2 (2 of 2)	0
Figure 2.6-3	0
Figure 2.6-4	0
Figure 2.6-5	0
Figure 2.6-6	0
Figure 2.6-7A	5
Figure 2.6-7B	5
Figure 2.6-7C	5
Figure 2.6-8A	5
Figure 2.6-8B	5
Figure 2.6-8C	5
Figure 2.6-9	0
Figure 2.6-10	0
Figure 2.6-11	5
Figure 2.6-12	5
Appendix 2A Tab	
Utah Land Cover Types	0
Appendix 2B Tab	
Life History Information	1
Appendix 2C Tab	
Relative Biological Value of Land Cover Types for Wildlife Species	0
Appendix 2D Tab	
Vegetation-Soil Site Type Inventory	0
Chapter 3 Tab	
3-i	6
3-ii	11
3.1-1	11
3.1-2	6
3.1-3	6
3.1-4	0
3.2-1	2
3.2-2	9
3.2-3	2
3.2-4	6
3.2-5	9
3.2-6	12
3.2-7	7
3.2-8	1

DOCUMENT CONTROL

PAGE	REVISION
3.3-1	11
3.3-2	11
3.3-3	11
3.3-4	11
3.3-5	1
3.3-6	6
3.3-7	6
3.3-8	6
3.3-9	6
3.3-10	6
3.3-11	6
3.3-12	6
3.4-1	0
3.4-2	1
3.5-1	11
3.5-2	0
Figure 3.1-1	2
Figure 3.1-2	0
Figure 3.1-3	0
Figure 3.1-4	0
Figure 3.1-5	1
Figure 3.2-1 (1 of 2)	1
Figure 3.2-1 (2 of 2)	12
Figure 3.2-2 (1 of 4)	2
Figure 3.2-2 (2 of 4)	2
Figure 3.2-2 (3 of 4)	2
Figure 3.2-2 (4 of 4)	2
Figure 3.3-1	8
Figure 3.3-2 (deleted)	11
Figure 3.3-3	0
Figure 3.3-4 (deleted)	11
Chapter 4 Tab	
4-i	7
4-ii	6
4-iii	7
4-iv	6
4-v	6
4-vi	6
4-vii	7
4-viii	6
4-ix	7
4-x	7
4.1-1	2

DOCUMENT CONTROL

PAGE	REVISION
4.1-2	6
4.1-3	6
4.1-4	6
4.1-5	6
4.1-6	6
4.1-7	6
4.1-8	6
4.1-9	10
4.1-10	6
4.1-11	10
4.1-12	6
4.1-13	7
4.1-13a	7
4.1-13b	7
4.1-13c	7
4.1-13d	7
4.1-14	6
4.1-15	6
4.1-16	6
4.1-17	6
4.1-18	6
4.1-19	6
4.1-20	6
4.1-21	6
4.1-22	6
4.1-23	6
4.1-24	7
4.1-25	11
4.1-26	11
4.2-1	0
4.2-2	6
4.2-3	12
4.2-4	6
4.2-5	8
4.2-6	6
4.2-7	7
4.2-7a	7
4.2-7b	7
4.2-8	6
4.2-9	8
4.2-10	6
4.2-11	6
4.2-12	6
4.2-13	6

DOCUMENT CONTROL

PAGE	REVISION
4.2-14	6
4.2-15	6
4.2-16	11
4.2-17	11
4.2-18	8
4.2-19	8
4.2-20	6
4.2-21	11
4.2-22	11
4.2-23	11
4.2-24	11
4.3-1	2
4.3-2	6
4.3-3	6
4.3-4	6
4.3-5	6
4.3-6	6
4.3-7	6
4.3-8	6
4.3-9	7
4.3-9a	7
4.3-9b	7
4.3-10	6
4.3-11	8
4.3-12	6
4.3-13	6
4.3-14	6
4.3-15	6
4.3-16	6
4.4-1	2
4.4-2	12
4.4-3	6
4.4-4	6
4.4-5	6
4.4-6	6
4.4-7	6
4.4-8	6
4.4-9	7
4.4-9a	7
4.4-9b	7
4.4-10	8
4.4-11	6
4.4.12	6
4.4.13	6

DOCUMENT CONTROL

PAGE	REVISION
4.4.14	6
4.4-15	6
4.4-16	6
4.5-1	9
4.5-2	6
4.5-3	6
4.5-4	6
4.5-5	6
4.5-6	6
4.5-7	6
4.5-8	6
4.5-9	6
4.5-10	6
4.6-1	0
4.6-2	6
4.6-3	9
4.6-4	0
4.7-1	0
4.7-2	0
4.7-3	0
4.7-4	1
4.7-5	11
4.7-6	1
4.7-7	1
4.7-8	1
4.7-9	6
4.7-10	6
4.7-11	6
4.7-12	6
4.7-13	11
4.7-14	11
4.7-15	11
4.7-16	11
4.7-17	11
4.7-18	6
4.7-19	6
4.7-20	6
4.8-1	6
4.8-2	6
4.8-3	11
4.8-4	11
4.8-5	7
4.8-6	6
Table 4.1-1	0

DOCUMENT CONTROL

PAGE	REVISION
Table 4.1-2	0
Table 4.1-3 (1 of 2)	6
Table 4.1-3 (2 of 2)	6
Table 4.1-4	6
Table 4.1-5	6
Table 4.1-6 (1 of 2)	7
Table 4.1-6 (2 of 2)	6
Table 4.1-7	8
Table 4.2-1	8
Table 4.3-1	6
Table 4.4-1	6
Table 4.7-1	6
Table 4.7-2	6
Figure 4.4-1	7
Appendix 4A	
Artist's Concepts of the PFSF, Intermodal Transfer Point, and the Low Corridor Rail Line/Sidings	7
Chapter 5 Tab	
5-i	2
5-ii	0
5.1-1	11
5.1-2	2
5.1-3	7
5.1-4	11
5.1-5	11
5.1-6	11
5.1-7	11
5.1-8	11
5.1-9	11
5.1-10	11
5.2-1	0
5.2-2	0
5.2-3	0
5.2-4	0
5.3-1	11
5.3-2	11
Chapter 6 Tab	
6-i	0
6-ii	0
6-iii	0

DOCUMENT CONTROL

PAGE	REVISION
6-iv	0
6.1-1	0
6.1-2	0
6.1-3	0
6.1-4	6
6.1-5	6
6.1-6	6
6.2-1	6
6.2-2	6
6.3-1	6
6.3-2	0
Table 6.1-1	0
Table 6.1-2 (sht 1 of 4)	3
Table 6.1-2 (sht 2 of 4)	3
Table 6.1-2 (sht 3 of 4)	3
Table 6.1-2 (sht 4 of 4)	3
Figure 6.1-1	0
Chapter 7 Tab	
7-i	7
7-ii	7
7-iii	6
7-iv	7
7.1-1	7
7.1-2	0
7.2-1	0
7.2-2	7
7.2-3	7
7.2-4	8
7.2-5	7
7.2-6	7
7.2-7	7
7.2-8	7
7.3-1	7
7.3-2	7
7.4-1	7
7.4-2	7
7.5-1	7
7.5-2	7
Table 7.3-1	8
Figure 7.2-1	0
Appendix 7A	
Basis for the Use of a 3.8% Discount Rate	7

DOCUMENT CONTROL

PAGE	REVISION
Appendix 7B	
At-Reactor Spent Fuel Storage Cost Summaries	8
Appendix 7C	
Summary of Avoided Costs (PFS Net Benefits)	8
Appendix 7D	
Basis for Using Spent Fuel Pool Storage Costs Following Shutdown And Prior to Decommissioning	7
Chapter 8 Tab	
8-i	7
8-ii	6
8-iii	3
8-iv	3
8-v	3
8-vi	3
8.1-1	0
8.1-2	1
8.1-3	0
8.1-4	7
8.1-5	7
8.1-6	7
8.1-7	7
8.1-8	7
8.1-9	7
8.1-9a	7
8.1-9b	7
8.1-9c	7
8.1-9d	7
8.1-9e	7
8.1-9f	7
8.1-10	6
8.1-11	6
8.1-12	6
8.1-13	6
8.1-14	6
8.1-15	7
8.1-16	7
8.2-1	0
8.2-2	0
8.2-3	0
8.2-4	0

DOCUMENT CONTROL

PAGE	REVISION
8.2-5	0
8.2-6	11
8.2-7	0
8.2-8	11
8.2-9	0
8.2-10	0
8.2-11	0
8.2-12	0
8.2-13	1
8.2-14	11
8.2-15	11
8.2-16	11
8.2-17	0
8.2-18	0
8.2-19	0
8.2-20	0
8.2-21	0
8.2-22	0
8.3-1	6
8.3-2	6
8.3-3	7
8.3-4	7
8.3-5	7
8.3-6	7
8.3-7	7
8.3-8	7
8.3-9	7
8.3-10	7
8.4-1	6
8.4-2	6
Table 8.1-1	3
Table 8.1-1A	3
Table 8.1-2 (1 of 5)	2
Table 8.1-2 (2 of 5)	0
Table 8.1-2 (3 of 5)	0
Table 8.1-2 (4 of 5)	0
Table 8.1-2 (5 of 5)	0
Table 8.1-3	0
Table 8.2-1	11
Figure 8.1-1	0
Figure 8.1-2	0
Figure 8.2-1	0
Figure 8.2-2	0
Figure 8.2-3	0

DOCUMENT CONTROL

PAGE	REVISION
Figure 8.2-4	0
Figure 8.2-5	0
Figure 8.2-6	0
Figure 8.2-7	0
Figure 8.2-8	0
Figure 8.2-9	0
Figure 8.2-10	0
Figure 8.2-11	0
Figure 8.2-12	0
Figure 8.2-13	0
Figure 8.2-14	0
Appendix 8A Tab	
PFSF Fuel Storage Site Proposal Initial Screening; Answers to Screening Questions	3
Appendix 8B Tab	
Private Fuel Storage Project Potential Host Community Description and Background	3
Appendix 8C Tab	
Response to Site Selection Questionnaire	3
Chapter 9 Tab	
9-i	7
9-ii	0
9-iii	7
9-iv	7
9.1-1	9
9.1-2	11
9.1-3	7
9.1-4	2
9.1-5	7
9.1-6	7
9.1-7	7
9.1-8	7
9.1-9	7
9.1-10	8
9.1-11	7
9.1-12	7
9.2-1	9
9.2-2	7
9.2-3	9
9.2-4	7
9.3-1	7

DOCUMENT CONTROL

PAGE	REVISION
9.3-2	0
9.4-1	7
9.4-2	0
9.5-1	7
9.5-2	0
9.6-1	2
9.6-2	7
9.6-3	2
9.6-4	1
Table 9.1-1 (1 of 4)	7
Table 9.1-1 (2 of 4)	7
Table 9.1-1 (3 of 4)	7
Table 9.1-1 (4 of 4)	7

The amount of storage capacity available is as follows (Data published by the Nuclear Regulatory Commission current as of November 4, 1998).

Utility	Reactor	Spaces Remaining
Consolidated Edison	Indian Point #1	Shut-down, fuel on-site
Consolidated Edison	Indian Point #2	457
Southern California Edison	San Onofre Unit #1	Shut-down, fuel on-site[1]
Southern California Edison	San Onofre Unit #2	672
Southern California Edison	San Onofre Unit #3	624
Genoa FuelTech (Dairyland Power Cooperative)	La Crosse Boiling Water Reactor	Shut-down, fuel on-site
American Electric Power	D. C. Cook Unit #1	1598 (shared)
American Electric Power	D. C. Cook Unit #2	
Florida Power and Light	Clinton	1381
GPU Nuclear	Oyster Creek	180
GPU Nuclear	TMI	583
Northern States Power	Monticello	1115
Northern States Power	Prairie Island Unit #1	125 (shared)
Northern States Power	Prairie Island Unit #2	
Southern Nuclear	Farley Unit #1	527
Southern Nuclear	Farley Unit #2	641
Utility	**Reactor**	**Spaces Remaining**
Southern Nuclear	Hatch Unit #1	1062 (shared)
Southern Nuclear	Hatch Unit #2	
Southern Nuclear	Vogel Unit #1	2392 (shared)
Southern Nuclear	Vogel Unit #2	

[1] Pool full; additional unit #1 assemblies being stored on an interim basis in Unit #2 and Unit #3 fuel pools and in space leased at the General Electric Morris Facility through 2002.

The storage capacity projected full-core off-load states for each unit are:

D. C. Cook Unit #1 - 2010
D. C. Cook Unit #2 - 2010
Indian Point Unit #2 - 2005
Oyster Creek - full core off-load lost 1996
TMI - 2009
Clinton - 2005
Monticello - 2006
Prairie Island Unit #1 - 2007
Prairie Island Unit #2 - 2007
San Onofre Unit #2 - 2006
San Onofre Unit #3 - 2006
Hatch Unit #1 - 2000
Hatch Unit #2 - 2000
Vogel Unit #1 - 2015
Vogel Unit #2 - 2015
Farley - Unit #1 - 2006
Farley Unit #2 – 2010

The need for the PFSF facility can be summarized under the four headings of economics, decommissioning capability, assurance of continued operations, and state restrictions. Following is a summary of how these needs relate to the PFSLLC member utilities.

Economics - Each of the PFSLLC member utilities made a conscientious decision to proceed with PFS based on the economics issue since it provides a lower cost alternative than the other options that are available. Most of the utilities have no capability remaining to re-rack within their existing pools. On-site dry storage is the only other option readily available. Due to economies of scale, spent fuel storage at a centralized storage facility is projected to be more cost effective than long-term storage of spent fuel at nuclear power plant sites until a DOE repository is available

Decommissioning Capability - Each of the PFS members that have fuel on-site (20 units) will reach the end of their operating license prior to the capability of the DOE's

3.2.1.3 Balance of Facility

The Balance of Facility is made up of the O&M Building and the Administration Building, both of which are single story steel frame buildings with pre-fabricated (insulated) metal siding and roofing panels. Construction of these two buildings will start on June 1, 2001 and will be completed by March 1, 2002 as part of Phase 1. Parking areas around the O&M Building and the Administration Building are surfaced with asphalt or concrete pavement.

3.2.1.4 Intermodal Transfer Point/Skull Valley Road

The intermodal transfer point (if required) will be located 1.8 miles west of the intersection of Interstate highway 80 and Skull Valley Road at the mainline Union Pacific Railroad approximately 24 miles north of the PFSF (Figure 3.2-1). At the intermodal transfer point there will be a short rail siding and a pre-engineered metal building, which will house a gantry crane for cask transfer. An access road will be provided to connect the intermodal transfer point to the frontage road which runs along the north side of Interstate highway 80.

Although the site is nearly level, rough grading will be required to level the site. Excavation will be required for installation of the mat foundation for the gantry crane and enclosure. The enclosure will be a pre-engineered metal building approximately 80-ft. wide by 100-ft. long and 54-ft. high. The access road will be an asphalt-paved private road approximately 30-ft wide and 400-ft. long.

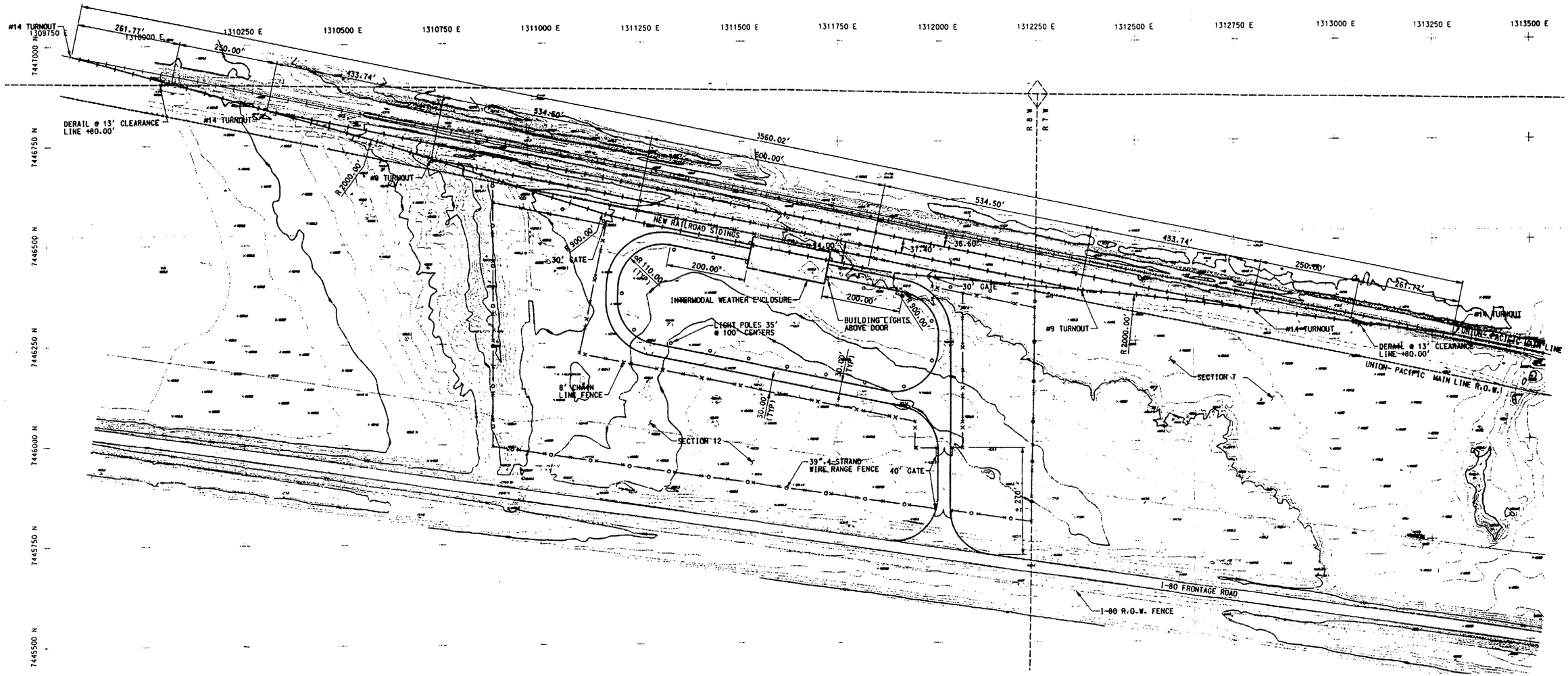
The equipment at the intermodal transfer point will be constructed between January 1 and December 31, 2001 to support testing and startup of the PFSF.

3.2.1.5 Low Corridor Rail Line

A new rail line, the preferred transportation method, will be constructed by the PFSLLC to connect the PFSF directly to the Union Pacific mainline railroad at Low. The rail line will be approximately 32 miles long and will originate from the mainline on the south side of Interstate highway 80 at Low (Figure 3.2-2). From the mainline at Low, the rail line will proceed southeast parallel to Interstate highway 80 for approximately 3 miles, then turn south along the western side of Skull Valley for approximately 26 miles, and then turn east for approximately 3 miles to the PFSF. The rail line will consist of a single track installed on undeveloped public rangeland administered by the BLM.

Construction activities will begin at Low Junction where excavation will be required to connect the new line to the existing mainline railroad and to provide the required sidings. The existing grades are elevated where the railroad and interstate highway cross the north end of the Cedar Mountains. The mainline is depressed beneath the two Interstate highway 80 overpasses at Low Junction. The excavated soils will be stockpiled for use as fill for rail line construction in Skull Valley.

Construction of the rail line beyond the Low Junction will be on the relatively flat terrain of Skull Valley. Approximately 65 dry arroyos cross the transportation corridor. Sufficient culverts will be provided in the design to facilitate drainage from these arroyos and to allow passage of the 100-year flood. Construction will begin with clearing and grubbing activities as necessary to accommodate a 40 ft wide rail bed. The upper 6-in. of soil (topsoil) will then be excavated for a width of approximately 10-ft. (5-ft. on both sides of rail line centerline) and stockpiled for later use. The roadbed will be proof-rolled and backfilled with 1-ft. of compacted fill material (excavated or imported). A minimum of eight inches of sub-ballast will be placed on the prepared surface. The ties and rail will be laid on top of the sub-ballast and a rail construction machine will travel along the previously laid track and install the remaining crushed gravel or rock ballast (approximately 8 inches) beneath



SITE PLAN

Figure 3.2-1

INTERMODAL TRANSFER POINT
Sheet 2 of 2

PRIVATE FUEL STORAGE FACILITY
ENVIRONMENTAL REPORT

During the early stages of the project, construction activities would be likely to keep many species, especially raptors, away from the area. However, as casks are installed and activity moves to a different area, wildlife could move into the established areas.

Nevertheless, if left undeterred wildlife may exist inside the fenced areas of the PFSF and around the casks. Therefore to restrict habitation, PFS will monitor any wildlife activity onsite and will take measures to prevent habitation. Animal deterrent devices will be employed to keep all wildlife from being within the area for any length of time. A chain link fence, 8 ft high and embedded 1 ft into the ground, will be installed around the perimeter of the storage pads to prevent large wildlife such as deer antelope, coyotes, fox, rabbits, etc. from entering the area. If birds are found to be perching and/or nesting around or on the casks, and the potential exists for the birds to accrue doses in excess of PFSF's 100 rem/yr criteria for wildlife (Section 4.2.9.2.2), deterrent devices such as cones or spikes will be installed to prevent this from happening. Small mammals and reptiles will also be kept from remaining in the cask area, using traps if necessary. Furthermore, the entire area will be surveyed frequently by facility workers. If any permanent signs of wildlife are found, actions will be taken immediately to remove the animals.

Operational noise resulting from the human activity/traffic and operation of the concrete batch plant and other equipment could also have a limited effect on wildlife. Some individuals that are particularly intolerant of human presence are likely to avoid the immediate area. Operational noise is likely to be minimal (see Section 4.2.7) with most of the additional noise occurring during the day when wildlife is more accustomed to human activity.

Increased traffic along Skull Valley Road and the access road from the daily workforce is not likely to have an impact on wildlife since the percent increase in traffic is small. Table 4.2-1 identifies the number of personnel required to operate the PFSF (not including security personnel). At night and on weekends the workforce will be reduced to security personnel only. Travel to and from the PFSF site by personnel involved in PFSF operations is estimated to result in a

maximum increase of 84 operational vehicle trips on Skull Valley Road, increasing the current ADT of 325 vehicle trips to 409 vehicle trips.

4.2.3 Effects on Air Quality

The operation of the PFSF is not expected to have any measurable impact on the local meteorology or air quality. The heat given off from the surface of the casks will only have a trivial effect on the temperature of the air in the immediate vicinity of the casks and should have no discernable off-site impact on the atmosphere.

Precipitation events could result in some very localized fogging as water is evaporated from the surface of the casks but will only occur under high ambient humidity conditions during which time natural fogging events will be likely. The downwind extent of any such fogging will be very limited and the frequency of occurrence will be very small as the site area receives very little rainfall throughout the year (approximately 8 inches per year).

There are no significant air pollution sources associated with the operation of the PFSF. The only fuel burning equipment to be operated on-site will be small space heating furnaces, the infrequent use of a small emergency generator for testing purposes, and the storage cask transporter. Small space heating sources of air pollutants (less than one million Btu per hour heat input) are exempt from the Utah air quality regulations. The storage cask transporter is powered by a 220 horsepower diesel engine and is considered to be a mobile source which is not regulated by the DEQ. While it is considered that operation of the emergency diesel generator will be so infrequent as to have trivial emissions, the following quantifies emissions from the emergency diesel generator on a very conservative basis, assuming that it operates 500 hours per year.

The PFSF will utilize a 250 horsepower diesel generator during operation to supply back-up electrical power when normal service is interrupted. Criteria pollutant emissions

4.4 EFFECTS OF CONSTRUCTION AND OPERATION OF THE LOW CORRIDOR RAIL LINE

A new rail line will be constructed to connect the PFSF directly to the Union Pacific mainline railroad at Low. The single track rail line will be approximately 32 miles long and will originate from the mainline on the south side of Interstate 80 at Low. From the mainline at Low, the rail line will proceed southeast parallel to Interstate 80 for approximately 3 miles, then turn south along the western side of Skull Valley for approximately 26 miles, and then turn east for approximately 3 miles to the PFSF. Associated sidings will be located either at the PFSF or near Low Junction.

A 200 foot wide right-of-way for construction of the Low Corridor would temporarily remove or disturb about 776 acres of greasewood and desert shrub salt/brush habitat. A 40 foot wide rail line width is necessary to operate the rail line to the PFSF site; therefore approximately 155 acres would be permanently altered, and about 621 acres would be actively revegetated with appropriate naturally occurring species and restored to previous conditions following construction.

4.4.1 Effects on Geography, Land Use, and Demography

Construction of a new rail line will require the alteration of approximately 776 acres of land along the rail line. This estimate assumes that conventional construction practices will occur and that no additional land acquisition will be required. The rail line will result in the permanent alteration of approximately 155 acres.

The railroad turnout would be located on public land administered by the BLM, with right-of-way granted for the railroad. The full length of the rail line would require the granting of Right-of-Way from the BLM.

The Low Corridor rail line would cross the Eightmile and Black Knoll Pastures which are part of the Skull Valley grazing allotment. Construction activities related to the Low Corridor will temporarily disturb resident livestock and cause them to avoid the construction area. Impacts from the removal of habitat (776 acres temporarily and 155 acres permanently) is minimal when compared to the 271,00 acres of rangeland in Skull Valley. Operation of the rail line is not expected to adversely affect the use of the area for livestock grazing. Livestock will be able to freely cross the rail line tracks accessing rangeland on either side. Due to the infrequent number of trips (1-2 round trips/week) and the slow train speed (20 mph), collisions with livestock are not anticipated. Further consultation with BLM will be conducted to determine if any additional measures are required to insure livestock access and safety.

Recreational use for the land on either side of the rail line will be maintained by providing crossings where the rail line intersects off-highway vehicle trails or dirt roads.

There are no known wetlands or other environmentally sensitive areas along the entire 32-mile rail line. Horseshoe Springs and other local Skull Valley wetlands are well outside of the Low Corridor. The rail line will cross approximately 65 small and large dry arroyos. Small, medium, and large culverts; as well as short bridge crossings, will be constructed over these arroyos. Sufficient culverts will be provided in the design to facilitate drainage from these arroyos and to allow passage of the 100-year flood.

There are no demographic impacts along the entire rail corridor since the route does not encounter any private ranches or other members of the public. State inholdings along the route and a small piece of private land near Low Junction will be avoided. Therefore, relocation of residential structures, or realignment of fencing, driveways, and roadside utilities will not be required. In addition, all construction activity is south of Interstate 80 which eliminates any conflicts associated with the highway, such as overpass/underpass construction.

DOCUMENT CONTROL

PAGE	REVISION
a	12
b	12
c	12
d	12
License Application Tab	
i	0
ii	6
1-1	10
1-2	0
1-3	0
1-4	0
1-5	6
1-6	6
1-7	6
1-8	6
1-9	6
1-10	6
1-11	6
1-12	6
Figure 1-1	2
2-1	10
2-2	10
3-1	10
3-2	0
4-1	0
4-2	10
4-3	10
4-4	0
5-1	0
5-2	0
6-1	0
6-2	0
7-1	0
7-2	0
8-1	0
8-2	0

DOCUMENT CONTROL

PAGE	REVISION
9-1	0
9-2	0
10-1	10
10-2	0
11-1	0
11-2	0
12-1	0
12-2	0
13-1	0
13-2	0
Appendix A Tab -	
Proposed Technical Specifications Tab	
TS-i	12
TS-ii	12
TS-1	9
TS-2	9
TS-3	9
TS-4	9
TS-5	9
TS-6	9
TS-7	9
TS-8	9
TS-9	9
TS-10	9
TS-11	9
TS-12	9
TS-13	9
TS-14	9
TS-15	9
TS-16	9
TS-17	9
TS-18	9
TS-19	9
TS-20	9
TS-21	9
TS-22	9
TS-23	9
TS-24	9

DOCUMENT CONTROL

PAGE	REVISION
TS-25	9
TS-26	10
TS-27	11
TS-28	11
TS-28a	11
TS-28b	10
TS-29	9
TS-30	9
TS-31	9
TS-32	9
TS-33	9
TS-34	9
TS-35	11
TS-36	9
TS-37	10
TS-38	10
Appendix B Tab - Preliminary Decommissioning Plan Tab	
i	0
ii	0
1-1	0
1-2	0
2-1	0
2-2	0
2-3	0
2-4	0
3-1	0
3-2	0
4-1	4
4-2	10
4-3	10
4-4	4
4-5	10
4-6	5
5-1	0
5-2	4
5-3	4
5-4	4
6-1	0
6-2	10
6-3	0
6-4	0
7-1	0
7-2	0

Appendix C Tab -
Commitment Letters

i	12
ii	12
iii	12
iv	12

TABLE OF CONTENTS

SECTION	TITLE	PAGE
1.0	USE AND APPLICATION	TS-1
1.1	Definitions	TS-1
1.2	Logical Connectors	TS-3
1.3	Completion Times	TS-6
1.4	Frequency	TS-11
2.0	FUNCTIONAL AND OPERATING LIMITS	TS-14
2.1	Functional and Operating Limits	TS-14
2.1.1	Fuel Stored at the PFSF	TS-14
2.2	Functional and Operating Limits Violations	TS-15
2.2.1	Fuel Stored at the PFSF	TS-15
3.0	LIMITING CONDITION FOR OPERATION (LCO) APPLICABILITY	TS-16
3.0	SURVEILLANCE REQUIREMENT (SR) APPLICABILITY	TS-17
3.1	STORAGE CASK INTEGRITY	TS-19
3.1.1	STORAGE CASK Heat Removal System	TS-19
3.2	STORAGE CASK RADIATION PROTECTION	TS-21
3.2.1	CANISTER and TRANSFER CASK Removable Contamination	TS-21
3.2.2	STORAGE CASK Average Surface Dose Rates	TS-23
4.0	DESIGN FEATURES	TS-26
4.1	Site	TS-26
4.1.1	Site Location	TS-26
4.2	Storage Features	TS-26
4.2.1	Storage System	TS-26
4.2.2	Storage Capacity	TS-26
4.2.3	STORAGE CASK Spacing	TS-26
4.2.4	Site Temperature Limits	TS-27
4.2.5	Cask Transporter	TS-27
4.2.6	Storage Pads	TS-28
4.3	CANISTER TRANSFER BUILDING (CTB)	TS-28
4.3.1	TRANSFER CASK and CANISTER Lifting Devices	TS-28
4.3.2	CTB Structure Requirements	TS-28a
4.3.2.1	CTB and Stationary Lifting Devices	TS-28a

TABLE OF CONTENTS (continued)

SECTION	TITLE	PAGE
5.0	ADMINISTRATIVE CONTROLS	TS-29
5.1	Responsibility	TS-29
5.2	Organization	TS-30
5.2.1	Onsite and Offsite Organizations	TS-30
5.3	PFSF Staff Qualifications	TS-31
5.4	Procedures	TS-32
5.5	Programs	TS-33
5.5.1	Technical Specification Bases Control Program	TS-33
5.5.2	Radioactive Effluent Control Program	TS-34
5.5.3	Radiation Protection Program	TS-34
5.5.4	Onsite STORAGE CASK Transport Evaluation Program	TS-35
5.5.5	Pre-Operational Testing and Training Exercise	TS-37

TABLE OF CONTENTS

SAFETY ANALYSIS REPORT COMMITMENT LETTERS ISSUED SUBSEQUENT TO THE FINAL RAI RESPONSES

TITLE	DATE	SUBJECT
Commitment Resolution	March 17, 1999	Thermal/Seismic/Explosion Analysis/Geotechnical
Commitment Resolution Letter #2	March 19, 1999	Flooding Analysis
Commitment Resolution Letter #3	April 2, 1999	Seismic Program
Commitment Resolution Letter #4	April 14, 1999	Geotechnical
Commitment Resolution Letter #5	April 16, 1999	Emergency Plan-Offsite Assistance
Commitment Resolution Letter #6	May 10, 1999	Flooding Analysis
Commitment Resolution Letter #7	June 24, 1999	Geotechnical/Aircraft Hazards
Submittal of Commitment Resolution Letter #8 Information	July 9, 1999	Seismic Analysis
Commitment Resolution Letter #9	July 14, 1999	Aircraft Hazards
Commitment Resolution Letter #10	July 22, 1999	Seismic Analysis/ Aircraft Hazards
Commitment Resolution Letter #11	July 26, 1999	Aircraft Hazards
Commitment Resolution Letter #12	July 28, 1999	Geotechnical
Commitment Resolution Letter #13	July 30, 1999	Field Investigation Evaluation Report/Business Plan
Commitment Resolution Letter #14	August 6, 1999	Design Earthquake/ Geotechnical
Commitment Resolution Letter #15	August 6, 1999	Emergency Plan
Commitment Resolution Letter #16	August 10, 1999	Seismic Struts/Crane Uplift

TABLE OF CONTENTS

SAFETY ANALYSIS REPORT COMMITMENT LETTERS
ISSUED SUBSEQUENT TO THE FINAL RAI RESPONSES

TITLE	DATE	SUBJECT
Commitment Resolution Letter #17	September 3, 1999	Aircraft Hazards
Commitment Resolution Letter #18	October 13, 1999	Aircraft Hazards
Submittal of Commitment Resolution Letter #19 Information	October 15, 1999	Cask Storage Pad Sliding Analysis
Commitment Resolution Letter #22	November 19,1999	Geotechnical/Aircraft Hazards
Commitment Resolution Letter #23	January 7, 2000	Geotechnical
Commitment Resolution Letter #24	January 14, 2000	SER Open Items
Commitment Resolution Letter #25	January 18, 2000	Aircraft Hazards
Commitment Resolution Letter #26	February 23, 2000	Seismic Hazards
Commitment Resolution Letter #27	March 10, 2000	Fire/Explosion Hazards and Meteorological Items
Commitment Resolution Letter #28	March 28, 2000	Geotechnical Issues
Commitment Resolution Letter #29	April 10, 2000	Postulated Fires in the Canister Transfer Building
Commitment Resolution Letter #30	April 7, 2000	Postulated Propane Vapor Cloud Explosion
Commitment Resolution Letter #31	April 14, 2000	Meteorological Data for the PFSF

NOTE: Commitment Resolution Letters #20 and #21 are not included above since they only provided additional information in response to the commitments made in Commitment Resolution Letter #18.

TABLE OF CONTENTS

SAFETY ANALYSIS REPORT COMMITMENT LETTERS
ISSUED SUBSEQUENT TO THE FINAL RAI RESPONSES

TITLE	DATE	SUBJECT
Commitment Resolution Letter #32	April 18, 2000	Dugway Hazards
Commitment Resolution Letter #33	May 17, 2000	PFSF Cost Estimates
Commitment Resolution Letter #34	June 2, 2000	Geotechnical, Cranes, Cask Transporter Stability, Onsite Explosions/Fires, and Aircraft Hazards
Commitment Resolution Letter #35	June 17, 2000	Aircraft Hazards
Commitment Resolution Letter #36	September 20, 2000	Aircraft Hazards

TABLE OF CONTENTS

ENVIRONMENTAL REPORT COMMITMENT LETTERS
ISSUED SUBSEQUENT TO THE FINAL RAI RESPONSES

TITLE	DATE	SUBJECT
EIS Commitment Resolution Letter #1	November 12, 1999	Water Sources/RR Right of Way/Air Emissions/Dose Rates/Photographic Equipment/Cost Benefit
EIS Commitment Resolution Letter #2	November 19, 1999	Water Sources/ Cost Benefit
EIS Commitment Resolution Letter #3	December 7, 1999	Meteorological Data/Wyoming Site Doses
EIS Commitment Resolution Letter #4	January 26, 2000	Cost Benefit Analysis
EIS Commitment Resolution Letter #5	February 15, 2000	Environmental Report Issues
EIS Commitment Resolution Letter #6	February 22, 2000	Environmental Report Issues
EIS Commitment Resolution Letter #7	February 25, 2000	Environmental Report Issues
EIS Commitment Resolution Letter #8	March 9, 2000	Cost Benefit Analysis
EIS Commitment Resolution Letter #9	April 28, 2000	PFSF Radiation Dose Estimates
EIS Commitment Resolution Letter #10	April 28, 2000	Cost Benefit Analysis
EIS Commitment Resolution Letter #11	May 3, 2000	PFSF Radiation Dose Estimates
DEIS Commitment Resolution Letter #1	September 15, 2000	Water Sources

Private Fuel Storage, L.L.C.

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September 20, 2000

COMMITMENT RESOLUTION LETTER 36
DOCKET NO. 72-22 / TAC NO. L22462
PRIVATE FUEL STORAGE FACILITY
PRIVATE FUEL STORAGE L.L.C.

Reference: 1. PFS, Aircraft Crash Impact Hazard at the Private Fuel Storage Facility, Revision 4 (August 10, 2000)
2. www-afsc.saia.af.mil/AFSC/RDBMS/Flight/stats
3. Fax from Paul Price, HQ Air Force Safety Center, to Brig. Gen. James Cole, USAF (Ret.) (Jan. 26, 2000).

On September 19, 2000, the Nuclear Regulatory Commission (NRC) asked Private Fuel Storage (PFS) to provide information on the number of times U.S. Air Force aircraft had jettisoned live, but unarmed, ordnance in the last 20 years.

As set forth in Reference 1 (p. 83b), the Air Force has advised PFS that the probability that live but unarmed ordnance would explode upon being jettisoned is "remote." The Air Force had no records of such ordnance exploding in the last 10 years and had records of only two instances earlier, one in Fiscal Year 1989 and one in Fiscal Year 1985, in which jettisoned live but unarmed ordnance did explode. (Reference 1, p. 83b, note 88A2). Based on this information and the expert judgment of Brigadier General James Cole, USAF (Ret.), Major General Wayne Jefferson USAF (Ret.), and Colonel Ron Fly USAF (Ret.), PFS assumed (for the purpose of calculating the probability that jettisoned ordnance landing near the PFSF would explode and adversely impact the storage casks) that the probability the unarmed ordnance would explode after being jettisoned was 1 percent.[1] (Reference 1, p. 83i)

As PFS stated in Reference 1 (p. 83b, note 88A2), in response to PFS FOIA requests, the Air Force stated that it had no records of the number of times its aircraft had jettisoned live, but unarmed, ordnance in the last 20 years. Nevertheless, a rough estimate can be made of the number of sorties on which live ordnance was jettisoned based on the

[1] PFS defined an adverse impact as a cask tip over, which would not necessarily result in a release of radioactive material. (Reference 1, pp. 83b-83c)

fraction of sorties that carry live ordnance, the number of mishaps in the last 20 years, and the fraction of mishaps attributable to engine failure, in which the pilot would normally jettison the aircraft's ordnance. This estimate does not include any other situations in which the pilot could jettison ordnance, such as when a pilot has attempted to release ordnance normally and the ordnance has failed to separate from the aircraft.

The number of sorties on which ordnance was jettisoned because of an aircraft mishap, J, may be calculated as follows:

$J = M \times f_{lo} \times f_e$ where

M is the number of mishaps in the last 20 years involving aircraft that carry jettisonable ordnance

f_{lo} is the fraction of sorties on which live ordnance was carried

f_e is the fraction of mishaps resulting from engine failures

The number of mishaps involving Air Force aircraft that carry jettisonable ordnance in the last 20 years includes all mishaps involving the following fighter and attack aircraft: F-4, F-15E, F-16, F-104, F-105, F-111, FB-111, F-117, A-7, A-10, and A-37. To be consistent with PFS's approach to calculating aircraft crash rates, PFS determined, from an Air Force database (Reference 2), the number of mishaps involving the listed aircraft from FY 1979 to FY 1998. To best capture the number of engine failures PFS used Class A mishaps. Thus, M = 641.

The fraction of sorties on which live ordnance was carried can be estimated on the basis of current Air Force practice at Hill Air Force Base, where approximately 5 percent of the F-16 sorties carry live ordnance. (Reference 1, p. 83h) Thus, $f_{lo} = 0.05$.

The fraction of mishaps attributable to engine failure, in which the pilot would normally jettison the aircraft's ordnance in response to the mishap, may be estimated on the basis of the fraction of F-16 mishaps attributable to engine failure. (Reference 1, Tab H, p. 12) Thus, $f_e = 58/121$ or 48 percent.

Therefore,

$J = 641 \times 0.05 \times 0.48 = 15$

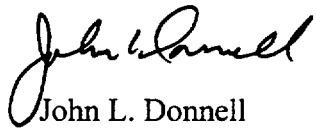
This estimate of 15 instances of jettisoned live, but unarmed ordnance (based on engine failure alone) in the last 20 years is understated, as stated above, in that it does not account for instances in which the pilot jettisoned ordnance in situations other than mishaps. It is unknown how often such instances occurred; however, PFS notes that both instances in which jettisoned unarmed ordnance exploded in the last 20 years were intentional jettisons under controlled conditions and thus neither occurred during a mishap. (Reference 3)

Although the above calculated instances of jettisoned live, but unarmed, ordnance suggests that the likelihood of such ordnance exploding could be greater than 1%, the calculation only accounts for jettisoned ordnance occurring as a result of engine failure. Because this calculation does not take into account the other situations in which live, but unarmed, ordnance may be jettisoned, it remains the judgment of PFS's experts that the order of magnitude estimate of 1% of jettisoned ordnance exploding, based on the Air Force's statement that such an event is "remote," provided in Reference 1, is both reasonable and conservative.

Finally, PFS notes that even if it is assumed for the purpose of analysis that the probability that unarmed jettisoned ordnance would explode is 100 percent, instead of the 1 percent that PFS assumed in Reference 1, the probability that an explosion of jettisoned ordnance that landed near the PFSF would adversely impact the storage casks would increase from 2.43×10^{-10} to approximately 2.43×10^{-8}. (See Reference 1, p. 831) If that probability is added to the cumulative probability that an aircraft crash would result in an impact at the PFSF (6.6×10^{-7}, Reference 1, p. 87), the resultant probability (6.8×10^{-7}) remains well below the NRC regulatory limit of 10^{-6} per year. The assumption that 100 percent of all jettisoned live, but unarmed, ordnance would explode is unreasonably conservative in light of the Air Force's statement that the probability is "remote." Nevertheless, it serves to illustrate the insensitivity of PFS's aircraft crash hazard assessment to this issue.

If you have any questions regarding this response, please contact me at 303-741-7009.

Sincerely



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September 15, 2000

DRAFT ENVIRONMENTAL IMPACT STATEMENT (DEIS)
COMMITMENT RESOLUTION LETTER #1
DOCKET NO. 72-22 / TAC NO. L22462
PRIVATE FUEL STORAGE FACILITY
PRIVATE FUEL STORAGE L.L.C.

References: 1. September 1, 2000 telephone call between the NRC, Private Fuel Storage (PFS), and Stone and Webster (S&W)

During the above referenced telephone call, Mr. Scott Flanders of the NRC requested additional information regarding groundwater in the Skull Valley area and the availability of water from offsite water sources. The NRC request is documented below along with the PFS response.

NRC Requests/Questions

Groundwater on the Skull Valley Reservation

1. If additional water wells are necessary to supply water for worker use and for making concrete for construction of the Private Fuel Storage Facility (PFSF), will PFS drill additional wells only on the Skull Valley reservation, or elsewhere in Skull Valley?

RESPONSE

PFS would only drill wells on the Skull Valley reservation. This is addressed in Section 4.5.5 of the PFSF Environmental Report, which states the following:

"In the event that onsite water quality or quantity are inadequate, potable water will be obtained directly from the Reservation's existing supply, or an additional well or wells will be drilled east of the site, where the quantity and quality of ground water are likely to be more satisfactory. These wells would be outside of the OCA [owner controlled area], but they would still be on the Reservation."

2. What are the Skull Valley Band of Goshute's water rights in Skull Valley concerning groundwater? Are there agreements between the State of Utah and the Band concerning water rights in Skull Valley? Are the Band's water rights limited to the water underlying the Skull Valley reservation? Are there any restrictions on the Band's use of the groundwater that they have rights to, and if so, who has jurisdiction and with whom must the Band interface? If the Band has unlimited rights to the groundwater underlying the reservation, is there a limit on groundwater that PFS could obtain?

RESPONSE

2a. *What are the Skull Valley Band of Goshute's water rights in Skull Valley concerning groundwater?*

The Skull Valley Band's water rights to groundwater in Skull Valley arise under well established federal law. The Skull Valley Reservation was established by executive orders of September 7, 1917, and February 15, 1918 (IV Kappler, Indian Affairs, Laws and Treaties 1049). The former order set aside approximately 17,920 acres and the latter 640 acres. At the time the Reservation was established, the doctrine of federal reserved water rights operated to reserve from then unappropriated sources of water appurtenant to the Reservation an amount necessary to fulfill the purpose of the Reservation. The reserved water right vested at the creation of the Reservation. Thus, under the Indian reserved rights doctrine, the larger parcel has a 1917 priority date and the smaller one 1918. The purpose has been described generally as maintenance of a permanent tribal homeland. More specifically, the purpose has been addressed in terms of the amount of water to irrigate practicably irrigable acreage, maintain fisheries, and supply domestic, municipal and industrial needs.

The federal government holds title to the reserved water right in trust for the benefit of the Skull Valley Band. The reserved water right cannot be lost by nonuse. *Colville Confederated Tribes v. Walton*, 460 F. Supp. 1320, 1326 (E.D. Wash. 1978), *aff'd on other grounds*, 647 F.2d 42 (9th Cir.), *cert. denied*, 454 U.S. 1092 (1981). The reserved rights doctrine is judicially created and does not depend on state law or procedure for its existence. The right was first expressed in *Winters v. United States*, 207 U.S. 564 (1908); and further developed in *Arizona v. California*, 373 U.S. 546 (1963), 376 U.S. 340 (1964) (decree), 439 U.S. 419 (1979) (supplemental decree), 460 U.S. 605 (1983) (omitted land and disputed boundary land claims), 466 U.S. 144 (1984) (second supplemental decree); *Cappaert v. United States*, 426 U.S. 128 (1976); and *United States v. New Mexico*, 438 U.S. 696 (1978).

In Opinion M-36164, September 10, 1953, "Applicability to Indian Lands in Arizona Law Regulating Withdrawal of Ground Water," II Op. Sol. on Indian Affairs 1618 (U.S.D.I. 1979), the Solicitor concluded that state ground water laws were not enforceable against Indian lands because "the application of State laws to Indians on Indian reservations is excluded unless Congress has specifically made them applicable,

and this general proposition has been applied to Indian water rights, which have been held to be reserved exclusively for the benefit of Indians." *Id.* At 1619. The Solicitor further concluded that the Secretary is without power to make an agreement, even with the consent of the Indians, to make state laws applicable to tribal water resources because 25 U.S.C. § 177 "prohibits any alienation of Indian 'lands,' and lands commonly include the appurtenant water rights." *Id.*

Specifically with regard to the State, the Solicitor has concluded that "[u]nder the Winters doctrine there appears to be no question but that the Indians' water rights of the Uintah and Ouray Reservation are not subject to the laws of the State of Utah. This is so even where the reserved water right has not been quantified and adjudicated." "Water Rights--Uintah and Ouray Reservation--Interest of United States" (Nov. 14, 1960) II Op. Sol. on Indian Affairs 1892, 1893.

2b. *Are there agreements between the State of Utah and the Band concerning water rights in Skull Valley?*

No. Leon Bear, Chairman of the Skull Valley Band, has confirmed this.

2c. *Are the Band's water rights limited to the water underlying the Skull Valley Reservation?*

Not necessarily. To the extent that the aquifer underlying the reservation extends beyond the reservation boundary (which the USGS record indicates is the case) and the portion of the aquifer under the reservation is recharged by water migrating from off-reservation portions of the aquifer, then the Tribe would be entitled to the benefit of that recharge.

2d. *Are there any restriction on the Band's use of groundwater that they have rights to, and if so, who has jurisdiction and with whom must the Band interface?*

The Band's reserved water right is a usufructury right. The right to use water in the arid west is restricted to beneficial use. A water right owner is not at liberty to waste the scarce resource. The Band has sovereignty over its water resources and the governing body of the Band has authority to promulgate ordinances regarding the use of water by those within its jurisdiction. In the case of the Private Fuel Storage Lease, Section 1E contains specific provisions regarding water use by the applicant. Thus, in this case the Band has both governmental and proprietary control over water use by PFS.

The federal government as trustee for the Band has responsibility for protecting the Band's water rights. Congress has specifically instructed the Secretary of the Interior to insure a just and equal distribution of water among Indians whose lands need water to render them available for agricultural purposes. 25 U.S.C. § 381. *See also Hackford v. Babbitt*, 14 F.3d 1457 (10th Cir. 1994) (confirming the reserved rights doctrine's applicability to an Indian reservation in Utah and the Secretary's authority over a water project on the reservation.) Accordingly, the Band is subject to "interfacing" with the federal government in the management of its groundwater at least in the context of

irrigation uses. (Of course in this case the applicant's lease specifically provides for water use and that provision is subject to the Secretary's review and approval pursuant to 25 U.S.C. § 415.)

2e. *If the Band has unlimited rights to the groundwater underlying the reservation, is there a limit on groundwater that PFS could obtain?*

As mentioned above, the applicant's lease (Section 1E) contains specific provisions on water use for the project from reservation sources. The lease restricts PFS usage of water to that required for employee consumption and light industrial use.

3. Is there a more recent reference that discusses groundwater in the Skull Valley area than the Hood and Waddell study that was published in 1968? If not, provide a justification as to why this study is still applicable to the present groundwater conditions in Skull Valley.

RESPONSE

The Hood and Waddell study (1968) is still the most comprehensive discussion of groundwater conditions in Skull Valley. A regional study that included Skull Valley was published in 1981 (Schlotthauer et al., 1981). In that study groundwater budget data for the period 1970 to 1979 indicated virtually no change from the previous analysis of Hood and Waddell (1968). The State of Utah also used the Hood and Waddell data in their 1987 effort to become the Host State for the Superconducting Supercollider Project (SSC). Their solution to the water needs of that project was to develop a series of wells along the alluvial fan at the northeast end of Skull Valley. Water needs for the SSC project were estimated to be 2450 gpm. By comparison, the average withdrawal rate from the PFSF well(s) is estimated to be less than 2 gpm (Section 4.5.5 of the PFSF Environmental Report).

The USGS Salt Lake office was contacted and we were assured by the supervisor of the hydrology group, as well as K.M. Waddell, that there have been no other comprehensive ground water studies of Skull Valley since the work of Hood and Waddell (1968). There have been numerous studies at Dugway completed by USGS personnel and private contractors concerning groundwater contamination issues at various locations on the facility. These have no direct application to the PFSF, however.

As discussed in the PFSF Environmental Report, the remote location and a lack of private land suitable for development inhibit growth in Skull Valley. Population growth rates in Tooele County declined between 1980 – 1990 as compared to the previous decade. The total population of Skull Valley is estimated as 1916 with over 1700 persons residing at Dugway (Section 2.2.2.3 of the PFSF Environmental Report). Whereas population has undoubtedly increased in the settlement of Terra since the 1960s, other areas have likely declined. The disappearance of small, family-owned ranches in favor of large, single-owner operations and the "de-militarization" program of the 1990s undoubtedly have had

a negative impact on population in the area, although conclusive data will not be available until the Year 2000 Census has been tabulated.

Irrigation of land for cattle fodder is the single largest usage of water resources in Skull Valley and accounts for about 35% of the well and spring water used in the valley (Schlotthauer et al., 1981). The Hood and Waddell study indicated about 2600 acres were being irrigated at that time. Currently, there are approximately 2400 acres being irrigated in Skull Valley. The total acreage is slightly less than that being irrigated in the 1960s. It can reasonably be assumed that the long-term precipitation has not changed dramatically in the past 40 years in Skull Valley and, therefore, it can also be concluded that the water budget for Skull Valley has not changed much either. The Hood and Waddell report remains as valid today as it was when written in 1968.

Groundwater at the Intermodal Transfer Point near Timpie

4. Provide information on the depth to the water table below the planned location of the Intermodal Transfer Point near Timpie Utah.

RESPONSE

PFS has not performed subsurface investigations to determine the depth to water table near the planned location of the Intermodal Transfer Point near Timpie, UT because no water supply wells or leach fields for on-site septic systems will be constructed at the site. However, the depth to the water table can be estimated using the following logic.

Page 4.3-9 of the ER indicates:

> *The existing elevation of the ITP area is from 4220 ft. to 4225 ft. as determined from the Poverty Point, Utah and Timpie, Utah 7 1/2 minute USGS quadrangle topography map 5 ft. contours. The actual ITP will be designed nearer the elevation of 4225 ft. In 1986, the Great Salt Lake flooded to an historic elevation of 4211.85 ft., which is well below the ITP area elevation of 4220 ft. to 4225 ft.*
>
> *In addition, the Great Salt Lake Planning Project Draft Analysis of Proposed Management Alternatives, issued by the State of Utah Department of Natural Resources in January 1999, has designated the flood plain of the lake at 4212 ft. for planning purposes...*

The planned location of the Intermodal Transfer Point near Timpie, UT is fairly close to the mud flats surrounding the Great Salt Lake; therefore, it is reasonable to expect that the elevation of the water table will be fairly close to the elevation of the lake. Based on this assumption, and assuming that the ITP area will be only as high as elevation 4220 ft, the minimum existing elevation in the vicinity, the depth to the water table would be approximately 4220 – 4212, or 8 ft. Assuming the normal pool level is elevation 4193 ft, as shown on Corral Canyon, UT USGS 7.5 quadrangle topographic map, 1968, the depth

to water would be 4220 – 4193, or 27 ft. Therefore, the depth to the water table is estimated to range from about 8 ft to as much as 27 ft below grade at the planned location of the Intermodal Transfer Point near Timpie, UT.

Offsite Water Sources

5. Provide additional information on the availability of water in the Skull Valley area, including:
   (a) the proposed well sites that will supply water that will be trucked to the PFSF site?
   (b) who are the other users of water from the proposed well sites?
   (c) what fraction of the total water yield from the proposed well sites would be for PFSF facilities?
   (d) what impact would this water usage by PFS have on other users of the same water source(s)?

RESPONSE

PFS intends to lease or buy the water necessary for its construction needs from permitted water users in the vicinity of the rail line and the PFSF, which is a common practice in similar construction projects. To date, PFS has not entered into such a lease or purchase agreement, because such a contract would be premature this far in advance of the commencement of actual construction. Accordingly, no specific well site has been identified as the well that will supply water for the construction of the PFSF site or the rail line. Instead, PFS has investigated the permitted water rights and the water availability in the area to assure itself that adequate quantities of water are available to satisfy its construction needs. That investigation has demonstrated that such quantities are available and that the water laws of Utah are designed to ensure that a temporary change of use, such as that involved in PFS's leasing or buying this quantity of water from existing water users in the area, will not materially impact other users in the area.

Water to satisfy PFS's needs will be obtained by contracting with the holders of existing water rights. The Utah Division of Water Rights (the "Division" or the "Water Rights Division") has the exclusive jurisdiction over the allocation, administration, distribution, and use of water rights in the State of Utah. Included in this jurisdiction is the authority to approve or deny, based on specific criteria set forth in the water statutes, an application to appropriate a new water right. In approving a new water right application, the Division specifies, among other things, the use to which the water may be applied and the point of use. A change in the nature of the use requires the Division's approval of a change application. Prior to approving a new water right or a change application, the Division must conclude there is reason to believe that use of the new water right or the proposed change in use will not unreasonably impair the rights of other water right holders. If the Division determines that a proposed use of water will impair other rights, it will deny the application or approve it subject to conditions designed to avoid the

potential impairment. Accordingly, under Utah's water law, PFS's temporary use of existing water rights should not result in any material impairment of existing water rights.

The records of the Water Rights Division indicate that there are a number of water rights in the Skull Valley area that together represent a significant amount of permitted water uses. Attachment 1 is a chart that summarizes the information in the Division's records about those rights. Water rights for small quantities of water are not included. As reflected in the chart, many of these rights are for quantities of water that standing alone would satisfy the estimated water requirements for the construction of the PFSF and the rail line. In this regard, note that the quantity of water required to construct the rail line and Phase I of the PFSF is approximately 144 acre -feet of water[1] over the 18-month period of construction.

The Attachment 1 chart identifies water rights represented by both approved applications and certificated water rights. The approved applications represent decisions by the Water Rights Division that the applied-for use could be made without impairing existing rights. It should be noted that an approved application does not necessarily guarantee that the well or other diversion actually produces the amount of water permitted. On the other hand, certificated, or perfected, water rights are rights that have been fully developed and so recognized by the Division. In order to obtain a certificated or perfected water right, a water user must demonstrate that the well or other source produces the specified quantity of water. Specifically, once the holder of an approved application has constructed the diversion works, placed the specified quantity of water to beneficial use, submitted (through a registered engineer) proof of beneficial use to the Division, and that information has been field checked and deemed accurate, the Division issues a certificate evidencing the actual, verified water use. Thus, the Division's records indicate there are significant quantities of water under existing rights that could be used in the PFS construction activities without adversely affecting other existing water rights.

To assure itself that the quantity of water necessary to support its project is actually available, PFS has made inquiry of persons familiar with the water quantities and usage in the Skull Valley area as to whether there is water available in the area that could be leased or purchased and used to satisfy PFS's water needs. As previously reported, the conclusion of these individuals is that there is more than sufficient water available in the area to satisfy PFS's needs. In particular, these individuals have indicated to PFS that there are three permitted wells within a 15-mile radius of Low, which produce sufficient quantities of water to satisfy the existing, dedicated uses of the wells, as well as PFS's needs. Each of these wells is capable of producing, and is authorized to produce, over 400,000 gallons of water per day, and in no case does it appear that the current usage of the water exceeds one-half of that quantity. Further, each of these wells is held under an approved or perfected application, which was approved only after the Water Rights Division determined, in the exercise of its professional judgment, that there was no reason to believe that use of that quantity of water would impair other water rights.

[1] One acre-foot of water is equivalent to 325,872 gallons.

If you have any questions regarding this response, please contact me at 303-741-7009.

Sincerely

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

Attachments

Copy to (with enclosure):
Mark Delligatti
Scott Flanders
John Parkyn
Jay Silberg
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