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FINAL REPORT – VOLUME I of III

Fault Evaluation Study and Seismic Hazard Assessment, Revision 1

Private Fuel Storage Facility

Skull Valley, Utah

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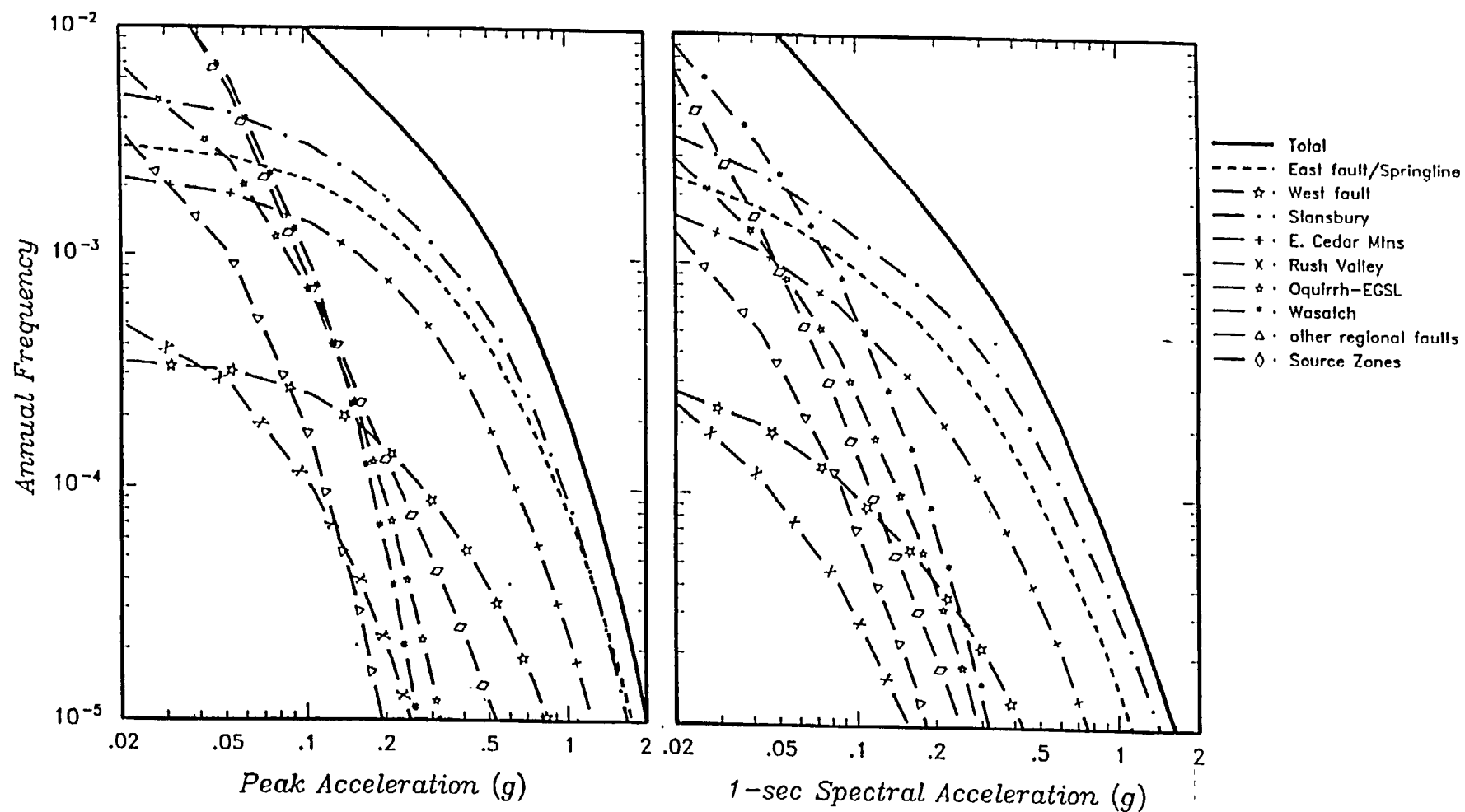
Project No. 4790.002

NUCLEAR REGULATORY COMMISSION

Docket No. _____ Official Ex. No. 185
In the matter of PFS
Staff _____ IDENTIFIED ✓
Applicant _____ RECEIVED _____
Intervenor ✓ REJECTED _____
Other _____ WITHDRAWN _____
DATE 5/13/02 Witness _____
Clerk V. McDaniel

Template = SECY-028

SECY-02



CONTRIBUTIONS OF INDIVIDUAL SOURCES TO TOTAL MEAN
HAZARD FOR HORIZONTAL MOTION AT THE CTB SITE.
Private Fuel Storage Facility
Skull Valley, Utah

Project No.
4790.002

Figure
6-12

TABLE 6-2

FAULT SOURCES-SOURCE CHARACTERIZATION PARAMETERS AND WEIGHTS

Private Fuel Storage Facility

Skull Valley, Utah

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| Fault | Map Designation | Probability of Activity | Total Length (km) | Downdip Geometry | Maximum Rupture Lengths (km) | Slip Rate (mm/yr) [wt] | Single Event Displacement ¹ (m) | Comments ² |
|-----------------------------------|-----------------|-----------------------------------|--------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|-----------------------------------------------------------------------------------------------------------|
| Mid-Valley Faults | | | | | | | | |
| East, West, and Springline faults | EF, WF, and SpF | EF [1.0] WF [1.0] SpF [0.8] | EF 28 [1.0] SpF 18 [1.0] EF/SpF 46 [1.0] | 45°W [0.33] 55°W [0.34] 65°W [0.33] | EF 12 [0.2] 18 [0.5] 28 [0.3] | EF 0.05 [0.1] 0.1 [0.3] 0.2 [0.4] 0.3 [0.19] 0.45 [0.01] | | See Figure 6-4 for logic tree showing alternate mid-valley fault sources included in seismic hazard model |
| | | | WF-Model A 23 [1.0] WF-Model B 36 [1.0] | In cases where the West fault is treated as an independent fault source, the dips of the East and West faults are modeled to be parallel to preclude intersections or truncations of the faults at depth. | SpF 18 [1.0] EF/SpF 12 [0.1] 18 [0.3] 28 [0.5] 46 [0.1] WF-Model A 12 [0.6] 23 [0.4] WF-Model B 12 [0.5] 21 [0.4] 36 [0.1] | WF 0.01 [0.2] 0.04 [0.5] 0.07 [0.2] 0.1 [0.1] EF-WF 0.05 [0.1] 0.1 [0.28] 0.2 [0.29] 0.3 [0.28] 0.45 [0.05] SpF 0.05 [0.2] 0.1 [0.2] 0.2 [0.35] 0.3 [0.2] 0.45 [0.05] EF/SpF and EF-WF/SpF Variable slip along strike | | |

TABLE 6-2 (CONTINUED)

FAULT SOURCES-SOURCE CHARACTERIZATION PARAMETERS AND WEIGHTS

Private Fuel Storage Facility

Skull Valley, Utah

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| Fault | Map Designation | Probability of Activity | Total Length (km) | Downdip Geometry | Rupture Lengths (km) | Slip Rate (mm/yr) | Single Event Displacement ¹ (m) | Comments/ ² References |
|-----------------------------------|-----------------|-------------------------|-------------------|-------------------------------------------|-----------------------------------------------------------|-----------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------------|
| | | | | | | based on above distributions | | |
| Stansbury | SZF | 1.0 | 73 | 45°W [0.33] 55°W [0.34] 65°W [0.33] | 23 [0.1] 47 [0.2] 32 [0.3] 56 [0.3] 7.3 [0.1] | 0.3 [0.2] 0.4 [0.6] 0.5 [0.2] | <u>AD</u> 1 [0.1] 2 [0.4] 3 [0.4] 4.5 [0.1] | |
| East Cedar Mountains | ECMF | 0.7 | 72 | 45°E [0.33] 55°E [0.34] 65°E [0.33] | 12 [0.3] 27 [0.4] 45 [0.25] 72 [0.05] | 0.01 [0.25] 0.04 [0.25] 0.07 [0.25] 0.1 [0.2] 0.45 [0.05] | | |
| Rush Valley Faults | | | | | | | | |
| Clover Fault [Model A (0.8)] | C | 1.0 | 19 [0.75] | 45°E [0.33] 55°E [0.34] 65°E [0.33] | 7.0 [1.0] 19 [1.0] | 0.01 [0.6] 0.05 [0.4] | <u>MD</u> [0.3] 0.6 [1.0] <u>AD</u> [0.7] 0.6 [1.0] | |
| Sheeprock [Model A (0.8)] | Sh | 1.0 | 19 [1.0] | 45°E [0.33] 55°E [0.34] 65°E [0.33] | 19 [1.0] | 0.01 [0.4] 0.05 [0.5] 0.1 [0.1] | | |
| West Side Zone [Model B (0.2)] | C & Sh | 1.0 | 52 | 45°E [0.33] 55°E [0.34] 65°E [0.33] | 18 [1.0] | 0.01 [0.4] 0.05 [0.5] 0.1 [0.1] | <u>MD</u> [0.3] 0.6 [1.0] <u>AD</u> [0.7] 0.6 [1.0] | |

TABLE 6-2 (CONTINUED)

FAULT SOURCES-SOURCE CHARACTERIZATION PARAMETERS AND WEIGHTS

Private Fuel Storage Facility

Skull Valley, Utah

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| Fault | Map Designation | Probability of Activity | Total Length (km) | Downdip Geometry | Rupture Lengths (km) | Slip Rate (mm/yr) | Single Event Displacement ¹ (m) | Comments/-References |
|------------------------------------------------|-----------------|-------------------------|-------------------|-------------------------------------------|----------------------------------|--------------------------------------|--------------------------------------------------------------------------------------------|----------------------|
| Oquirrh-East Great Salt Lake Fault Zone | | | | | | | | |
| Mercur [Model A (0.40)] | M | 1.0 | 27 | 45°W [0.33] 55°W [0.34] 65°W [0.33] | 16 [0.4] 27 [0.6] | 0.05 [0.5] 0.1 [0.4] 0.2 [0.1] | <u>MD</u> [0.3] 0.9 [0.5] 1.9 [0.5] <u>AD</u> [0.7] 0.9 [0.5] 1.9 [0.5] | |
| Topliff Hill [Model A (0.40)] | TH | 1.0 | 24 | 45°W [0.33] 55°W [0.34] 65°W [0.33] | 12 [0.4] 24 [0.6] | 0.05 [0.5] 0.1 [0.4] 0.2 [0.1] | | |
| Mercur-Topliff Hill [Model B (0.6)] | M-TH | 1.0 | 56 | 45°W [0.33] 55°W [0.34] 65°W [0.33] | 16 [0.2] 33 [0.5] 56 [0.3] | 0.05 [0.5] 0.1 [0.4] 0.2 [0.1] | <u>MD</u> [0.3] 0.9 [0.5] 1.9 [0.5] <u>AD</u> [0.7] 0.9 [0.5] 1.9 [0.5] | |
| Oquirrh (Model A [0.9]) | O | 1.0 | 35 | 45°W [0.33] 55°W [0.34] 65°W [0.33] | 12 [0.2] 21 [0.4] 35 [0.4] | 0.1 [0.3] 0.15 [0.5] 0.2 [0.2] | <u>MD</u> [0.3] 2.2 [0.5] 2.7 [0.5] <u>AD</u> [0.7] 2.2 [0.5] 2.7 [0.5] | |
| East Great Salt Lake (Model A [0.9]) | EGSL | 1.0 | 100 | 40°W [0.33] 50°W [0.34] 60°W [0.33] | 35 [0.3] 40 [0.4] 52 [0.3] | 0.2 [0.4] 0.4 [0.4] 0.7 [0.2] | | |
| Oquirrh & East Great Salt Lake | O & EGSL | 1.0 | 100 | 40°W [0.33] 50°W [0.34] | 21 [0.3] 35 [0.5] | 0.1 [0.2] 0.2 [0.4] | <u>MD</u> [0.3] 0.9 [0.5] | |

TABLE 6-2 (CONTINUED)

FAULT SOURCES-SOURCE CHARACTERIZATION PARAMETERS AND WEIGHTS

Private Fuel Storage Facility

Skull Valley, Utah

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| Fault | Map Designation | Probability of Activity | Total Length (km) | Downdip Geometry | Rupture Lengths (km) | Slip Rate (mm/yr) | Single Event Displacement ¹ (m) | Comments/ ² References |
|------------------------|-----------------|-------------------------|-------------------|---------------------------------------------------|----------------------|-----------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|
| (Model B [0.1]) | | | | 60°W [0.33] | 52 [0.2] | 0.4[0.3] 0.7[0.1] | 1.9 [0.5] | |
| East Tintic Mountains | ETM | 1.0 | 36 | 40°W [0.33] 50°W [0.34] 60°W [0.33] | 20 [0.4] 36 [0.6] | 0.005 [0.1] 0.01[0.4] 0.05 [0.4] 0.1 [0.1] | <u>AD</u> [0.7] 0.9 [0.5] 1.9 [0.5] | |
| West Valley Fault Zone | WVZ | 0.6 | 18 | 45°E [0.33] 55°E [0.34] 65°E [0.33] | 18 [1.0] | 0.3 [0.5] 0.5 [0.5] | | |
| Utah Lake faults | UL | 0.6 | 30 | 45°E [0.33] 55°E [0.34] 65°E [0.33] | 20[0.5] 30[0.5] | 0.3 [0.5] 0.5 [0.5] | | |
| Drum Mountains | DM | 1.0 | 36 | 45°E [0.33] 55°E [0.34] 65°E [0.33] | 36[1.0] | 0.02 [0.3] 0.05 [0.4] 0.2 [0.3] | <u>AD</u> [0.7] 2.4 [1.0] <u>MD</u> [0.3] 3.7 [1.0] | |
| Fish Springs | FS | 1.0 | 30 | 45°E [0.33] 55°E [0.34] 65°E [0.33] | 15 [0.5] 30 [0.5] | 0.02 [0.3] 0.05 [0.4] 0.2 [0.3] | <u>MD</u> 3.3 [1.0] | |
| Wasatch Fault Zone | WFZ | 1.0 | 370 | 45°E [0.33] 55°E [0.34] 65°E [0.33] 0.35 | | | | Seismic source model modified from Youngs and others (1987) and using recurrence data from McCalpin and Nishenko (1996) |

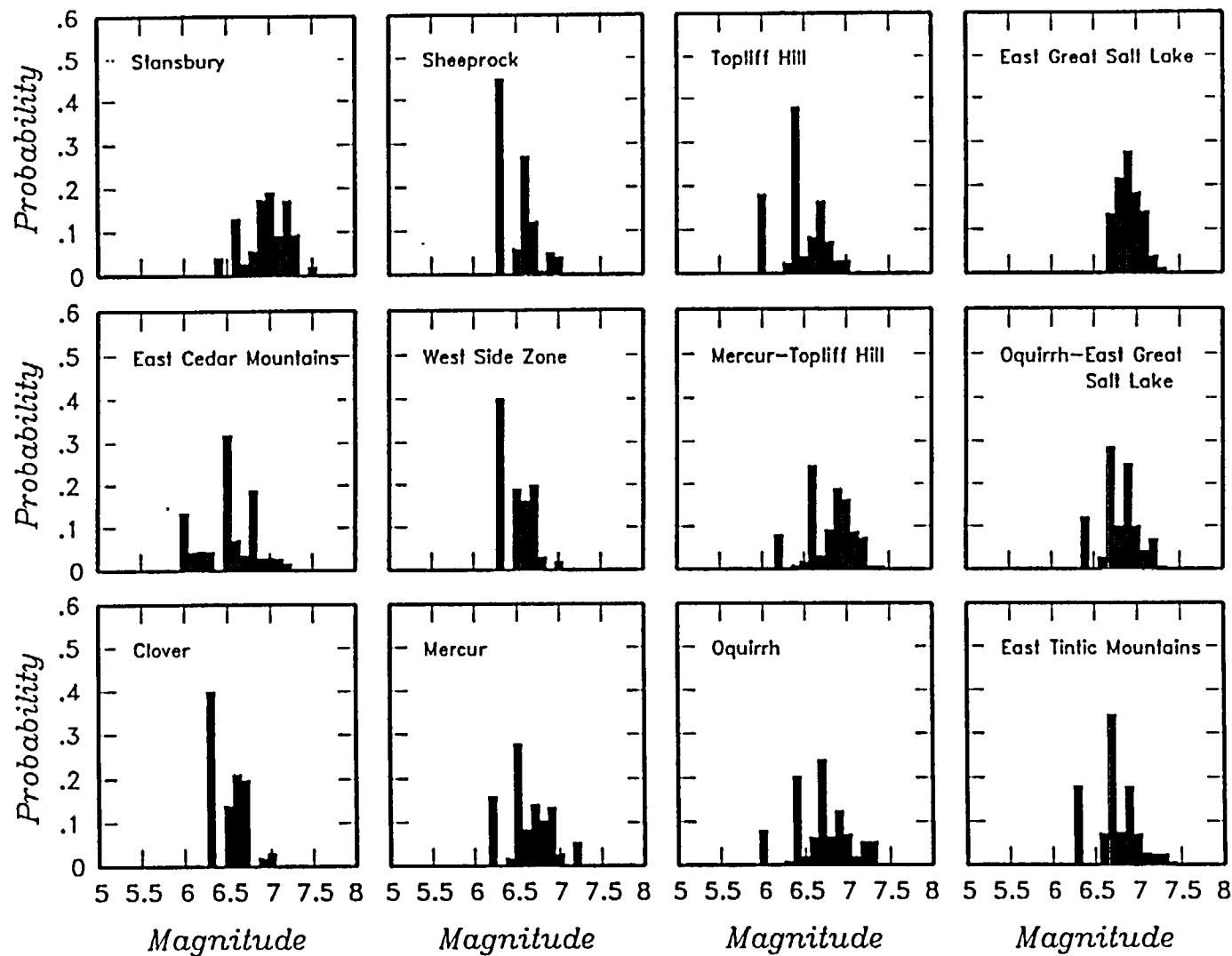
TABLE 6-2 (CONTINUED)

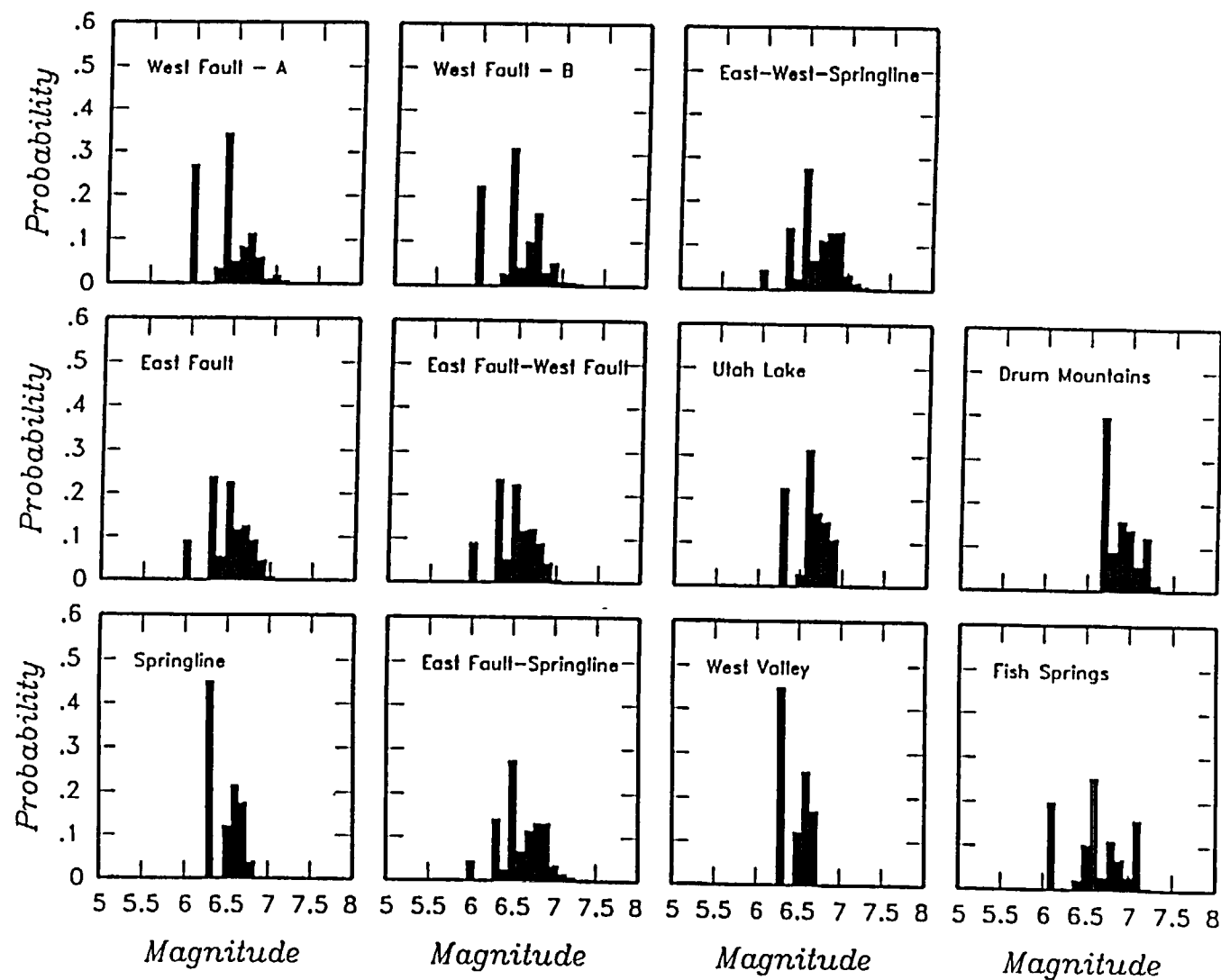
FAULT SOURCES-SOURCE CHARACTERIZATION PARAMETERS AND WEIGHTS
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Skull Valley, Utah

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| Fault | Map Designation | Probability of Activity | Total Length (km) | Downdip Geometry | Rupture Lengths (km) | Slip Rate (mm/yr) | Single Event Displacement ¹ (m) | Comments/ ² References |
|----------------------------|-----------------|-------------------------|-------------------|------------------|-------------------------------------------------|-----------------------------------------------------------------|--------------------------------------------|-----------------------------------|
| <i>(Unsegmented Model)</i> | | | | | 35 [0.05] 45 [0.4] 65 [0.5] 100 [0.05] | 0.7 [0.1] 0.9 [0.2] 1.1 [0.4] 1.3 [0.25] 1.8 [0.05] | | |
| <i>(Segmented Model)</i> | | | | | | | | |
| <i>Collinston*</i> | | | | | 30 [1] | 0.02 [0.45] 0.04 [0.45] 0.08 [0.1] | | |
| <i>Brigham City</i> | | | | | 40 [1] | • | | |
| <i>Weber</i> | | | | | 61 [1] | • | | |
| <i>Salt Lake City</i> | | | | | 46 [1] | • | | |
| <i>Provo</i> | | | | | 70 [1] | • | | |
| <i>Nephel</i> | | | | | 43 [1] | • | | |
| <i>Levan</i> | | | | | 30 [1] | 0.05 [0.1] 0.1 [0.4] 0.2 [0.4] 0.3 [0.1] | | |

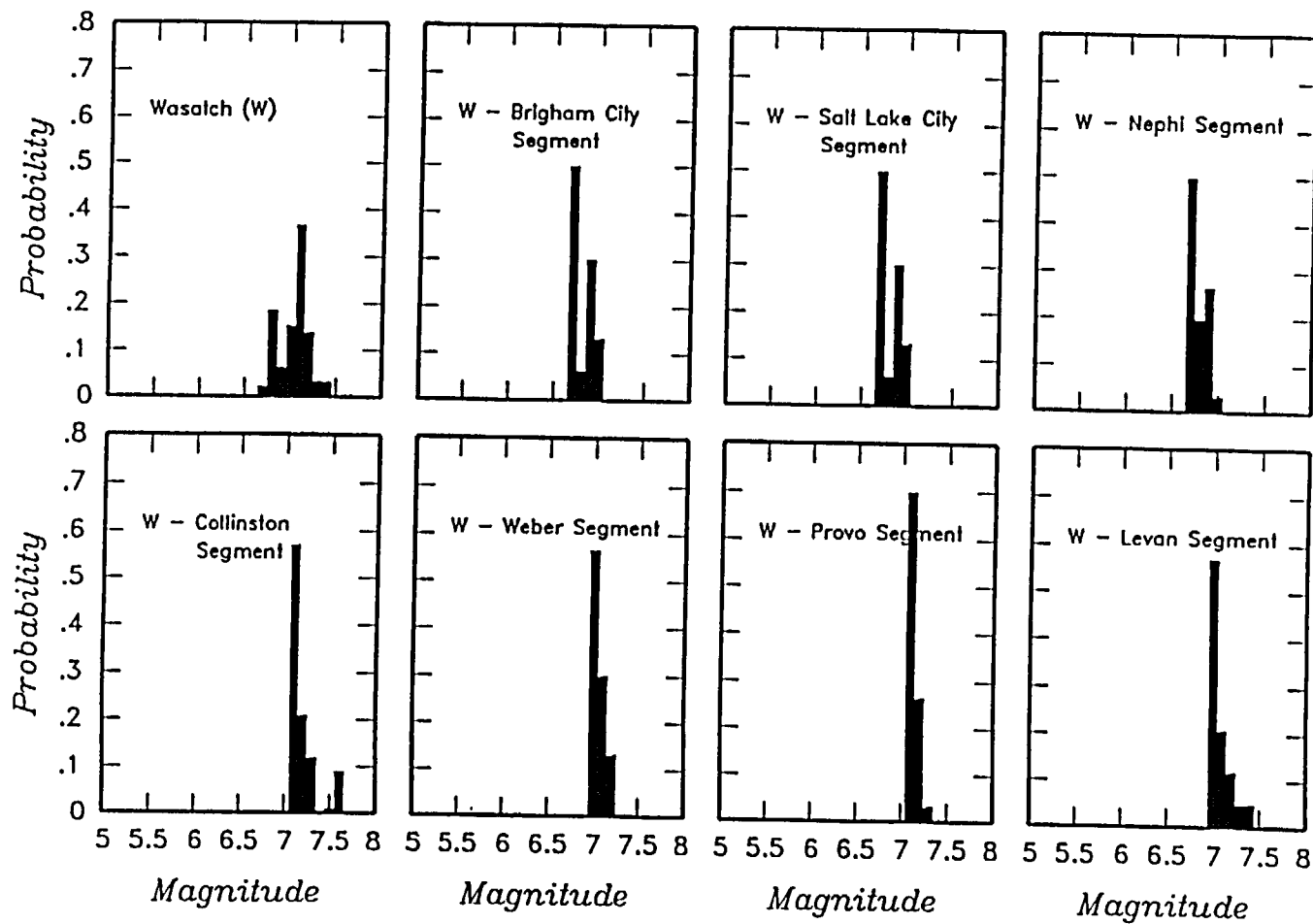
- ¹ MD = maximum displacement; AD = average displacement
² Frequency of events based on recurrence intervals from McCalpin and Nishenko (1995).





MAXIMUM MAGNITUDE DISTRIBUTIONS FOR FAULT SOURCES
 Private Fuel Storage Facility
 Skull Valley, Utah
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 Figure
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MAXIMUM MAGNITUDE DISTRIBUTIONS FOR FAULT SOURCES
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 Figure
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