

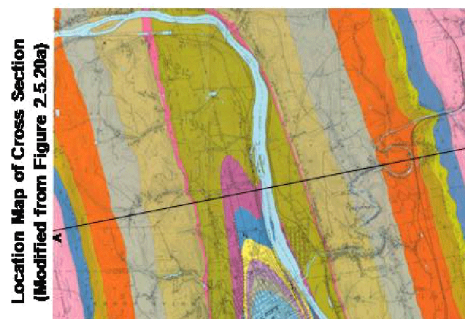
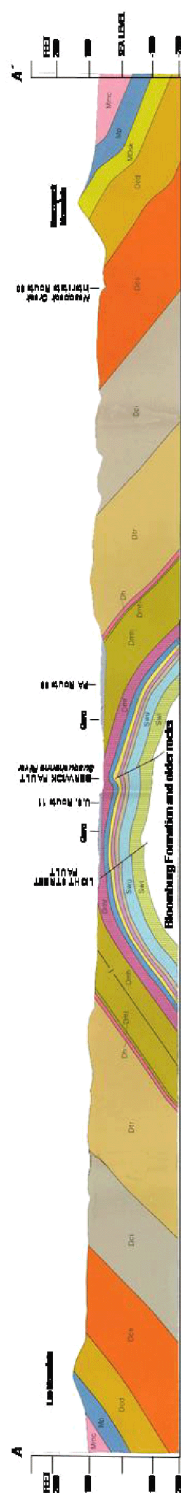
LEGEND:

- ★ Proposed Center Point of Bell Bend NPP (BBNPP)
- NPP Reactor 0.6-mile (1 km) Radius

NOTE:
Refer to Figure 2.5.1-21b for Legend.

Rev. 0

CROSS SECTION



CATSKILL FORMATION				REFERENCE, INDEXES, 1978
MAULCH CHAIK FORMATION <i>Manc</i>	POCONO MEMBER FORMATION <i>Mp</i>	SPEIGHTY KOPE FORMATION <i>LMSk</i>	DUNCANNON MEMBER <i>Dnd</i>	SHERMAN CREEK MEMBER <i>Dcs</i>
				IRISH VALLEY MEMBER <i>Ddi</i>
				TRIMBERS ROCK FORMATION <i>Dir</i>
				HARBELL FORMATION <i>Dh</i>
TULLY MEMBER FORMATION <i>Dnt</i>	MARCELLUS FORMATION <i>Dmr</i>	ONONDAGA FORMATION <i>Don</i>	OLDPORT FORMATION <i>Do</i>	KEYSER FORMATION <i>DSk</i>
				TOMCOLOWAY FORMATION <i>Sio</i>
				UPPER MEMBER SWU VALLEY FORMATION
				LOWER MEMBER SWL VALLEY FORMATION

BBNPP FSAR

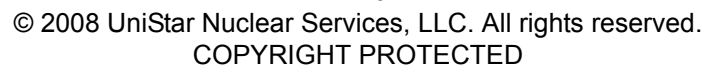


Figure 2.5-28 {Site Cross Section A-A'}

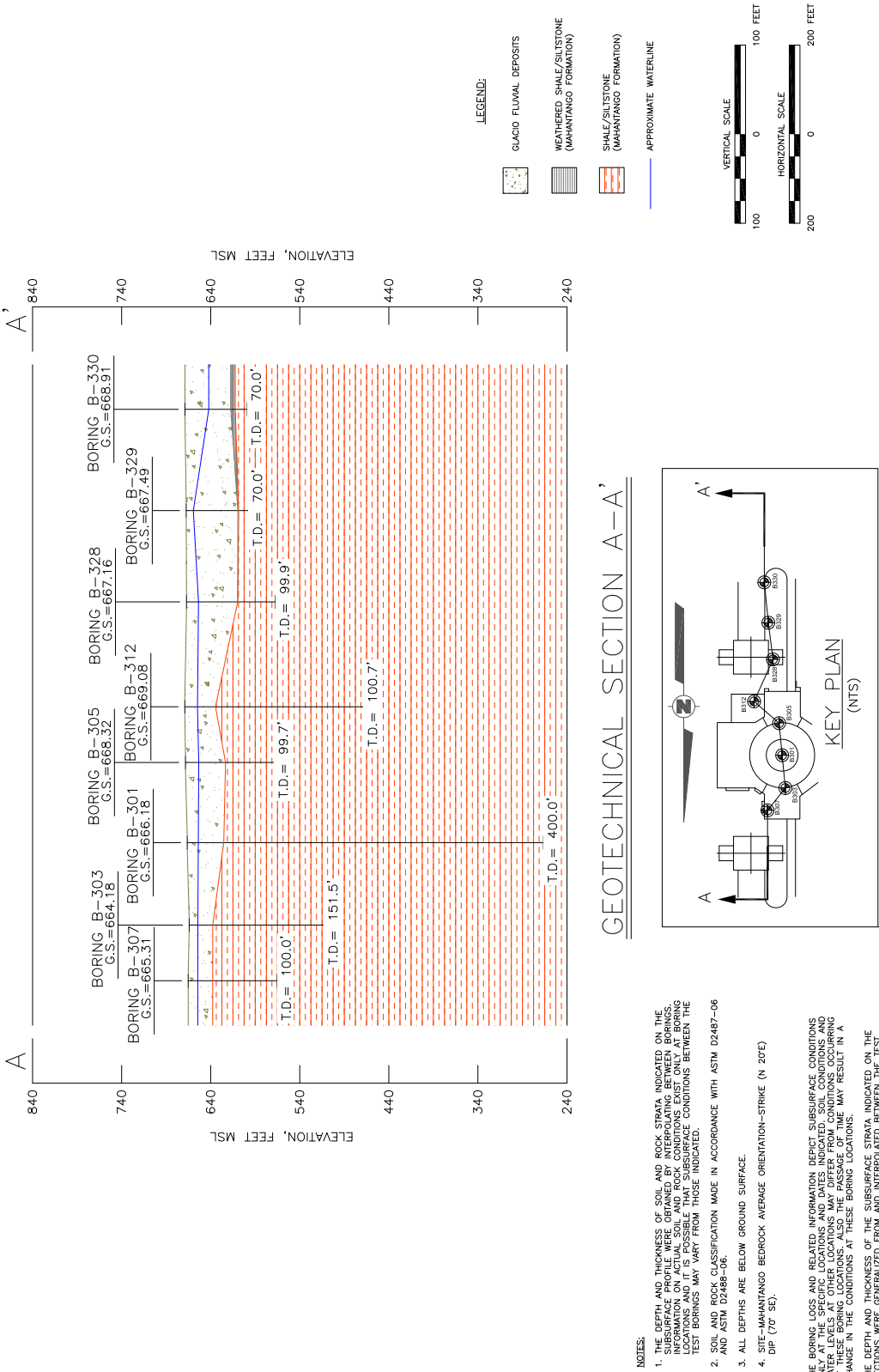
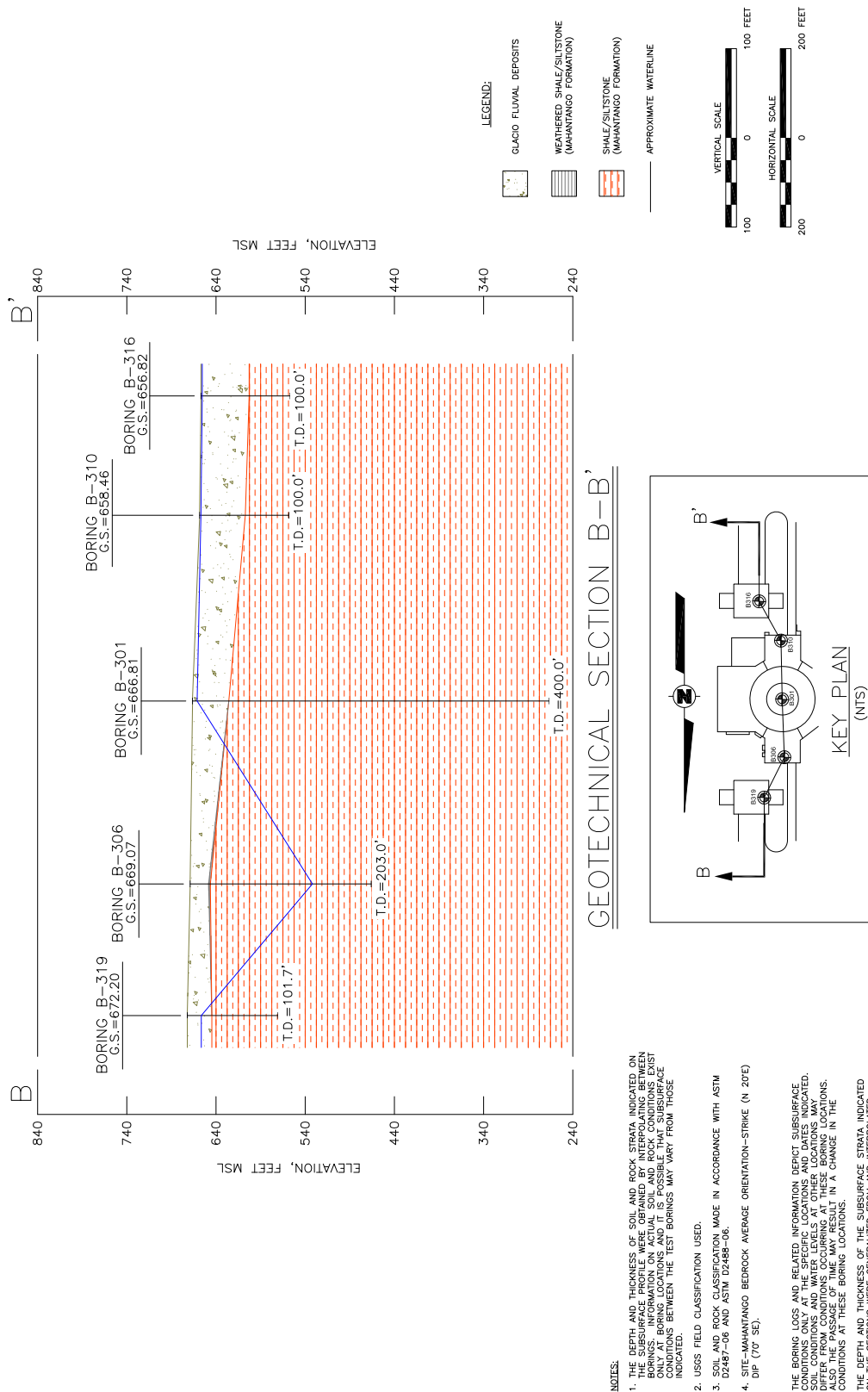
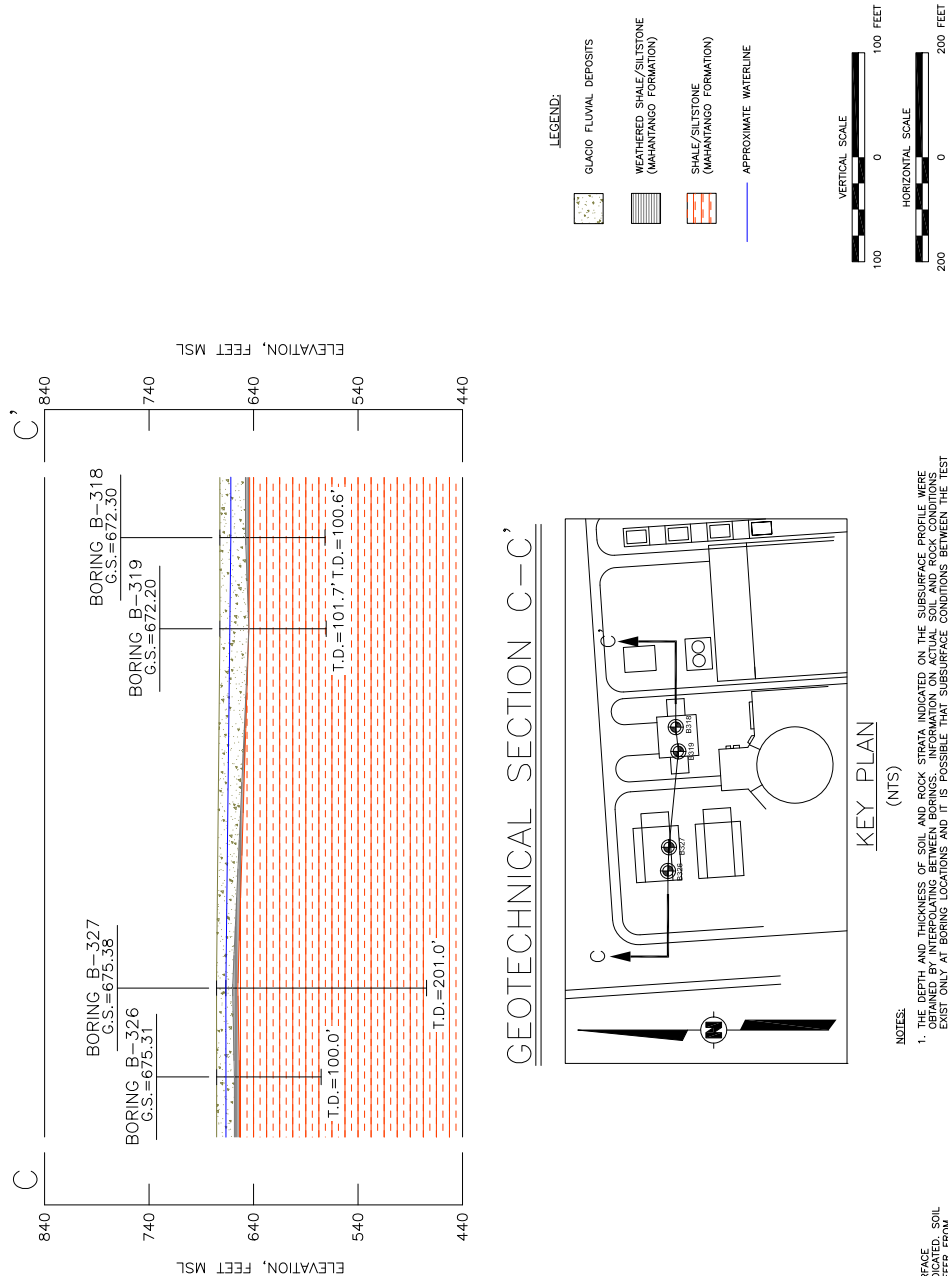


Figure 2.5-29 {Site Cross Section B-B'}



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Figure 2.5-30 {Site Cross Section C-C'}



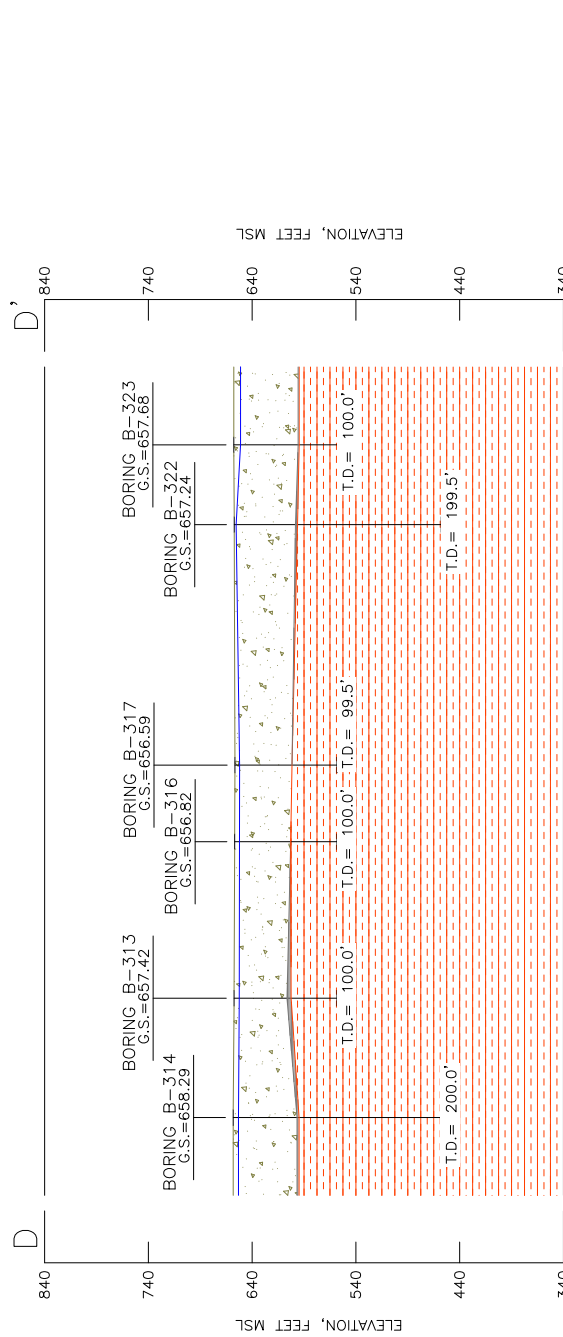
- NOTES:
1. THE DEPTH AND THICKNESS OF SOIL AND ROCK STRATA INDICATED ON THE SUBSURFACE PROFILE WERE OBTAINED BY INTERPOLATING BETWEEN BORINGS. INFORMATION ON ACTUAL SOIL AND ROCK CONDITIONS EXIST ONLY AT BORING LOCATIONS AND IT IS POSSIBLE THAT SUBSURFACE CONDITIONS BETWEEN THE TEST BORINGS MAY VARY FROM THOSE INDICATED.
 2. SOIL AND ROCK CLASSIFICATIONS MADE IN ACCORDANCE WITH ASTM D2487-06 AND ASTM D2486-06.
 3. ALL DEPTHS ARE BELOW GROUND SURFACE.
 4. SITE-MAHANTANGO BEDROCK AVERAGE ORIENTATION-STRIKE (N 20E) DIP (70° SE).

THE BORING LOGS AND RELATED INFORMATION, DEPICT SUBSURFACE CONDITIONS ONLY AT THE SPECIFIC LOCATIONS AND DATES INDICATED. SOIL CONDITIONS AND WATER LEVELS AT OTHER LOCATIONS MAY DIFFER FROM CONDITIONS OBSERVED AT BORING LOCATIONS. BORING LOGS MAY ALSO BE SUBJECT TO CHANGE IN THE CONDITIONS AT THESE BORING LOCATIONS.

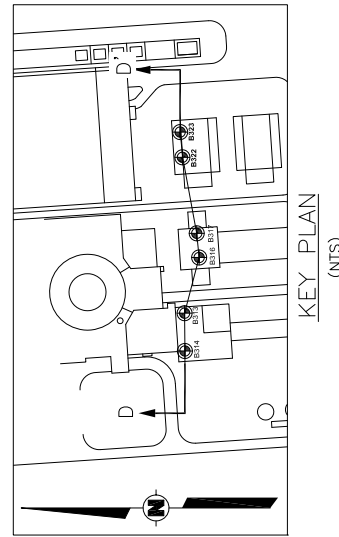
THE DEPTH AND THICKNESS OF THE SUBSURFACE STRATA INDICATED ON THE SECTIONS WERE GENERALIZED FROM AND INTERPOLATED BETWEEN THE TEST BORINGS. INFORMATION ON ACTUAL SUBSURFACE CONDITIONS EXISTS ONLY AT BORING LOCATIONS. INFORMATION ON ACTUAL SUBSURFACE CONDITIONS BETWEEN THE TEST BORINGS MAY VARY FROM THOSE INDICATED.

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Figure 2.5-31 {Site Cross Section D-D'}



GEOTECHNICAL SECTION D-D'

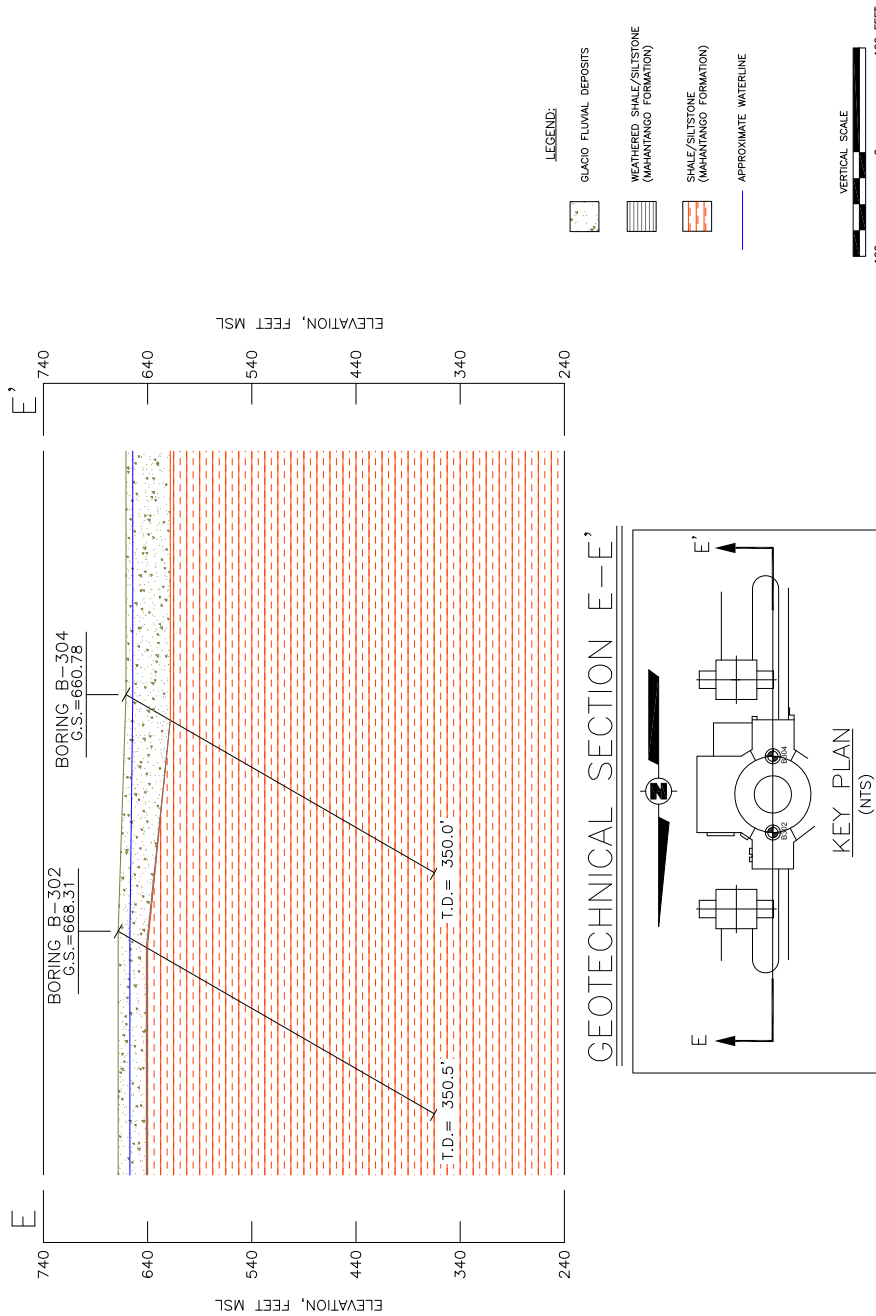


- NOTES:
1. THE DEPTH AND THICKNESS OF SOIL AND ROCK STRATA INDICATED ON THE SURFACE PROFILE WERE OBTAINED BY INTERPOLATING BETWEEN BORINGS. INFORMATION ON ACTUAL SOIL AND ROCK CONDITIONS EXIST ONLY AT BORING LOCATIONS AND IT IS POSSIBLE THAT SUBSURFACE CONDITIONS BETWEEN THE TEST BORINGS MAY VARY FROM THOSE INDICATED.
 2. SOIL AND ROCK CLASSIFICATIONS MADE IN ACCORDANCE WITH ASTM D2487-06 AND ASTM D2488-06.
 3. ALL DEPTHS ARE BELOW GROUND SURFACE.
 4. SITE-MAHANTANGO BEDROCK AVERAGE ORIENTATION-STRIKE (N 20°E) DIP (70° SE).

THE BORING LOGS AND RELATED INFORMATION DEPICT SURFACE AND SUBSURFACE CONDITIONS AT THE BORING LOCATIONS. SOIL CONDITIONS AND WATER LEVELS AT OTHER LOCATIONS MAY DIFFER FROM CONDITIONS OCCURRING AT THESE BORING LOCATIONS. ALSO THE DEPTHS AND THICKNESS OF THE SURFACE STRATA INDICATED ON THE TEST BORINGS WERE GENERALIZED FROM AND INTERPOLATED BETWEEN THE TEST BORINGS. INFORMATION ON ACTUAL SUBSURFACE CONDITIONS MAY VARY FROM THOSE INDICATED. IT IS POSSIBLE THAT SUBSURFACE CONDITIONS BETWEEN THE TEST BORINGS MAY VARY FROM THOSE INDICATED.

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Figure 2.5-32 {Site Cross Section E-E'}



CAD FILE: 073891818.dwg

Figure 2.5-33 {Site Cross Section F-F'}

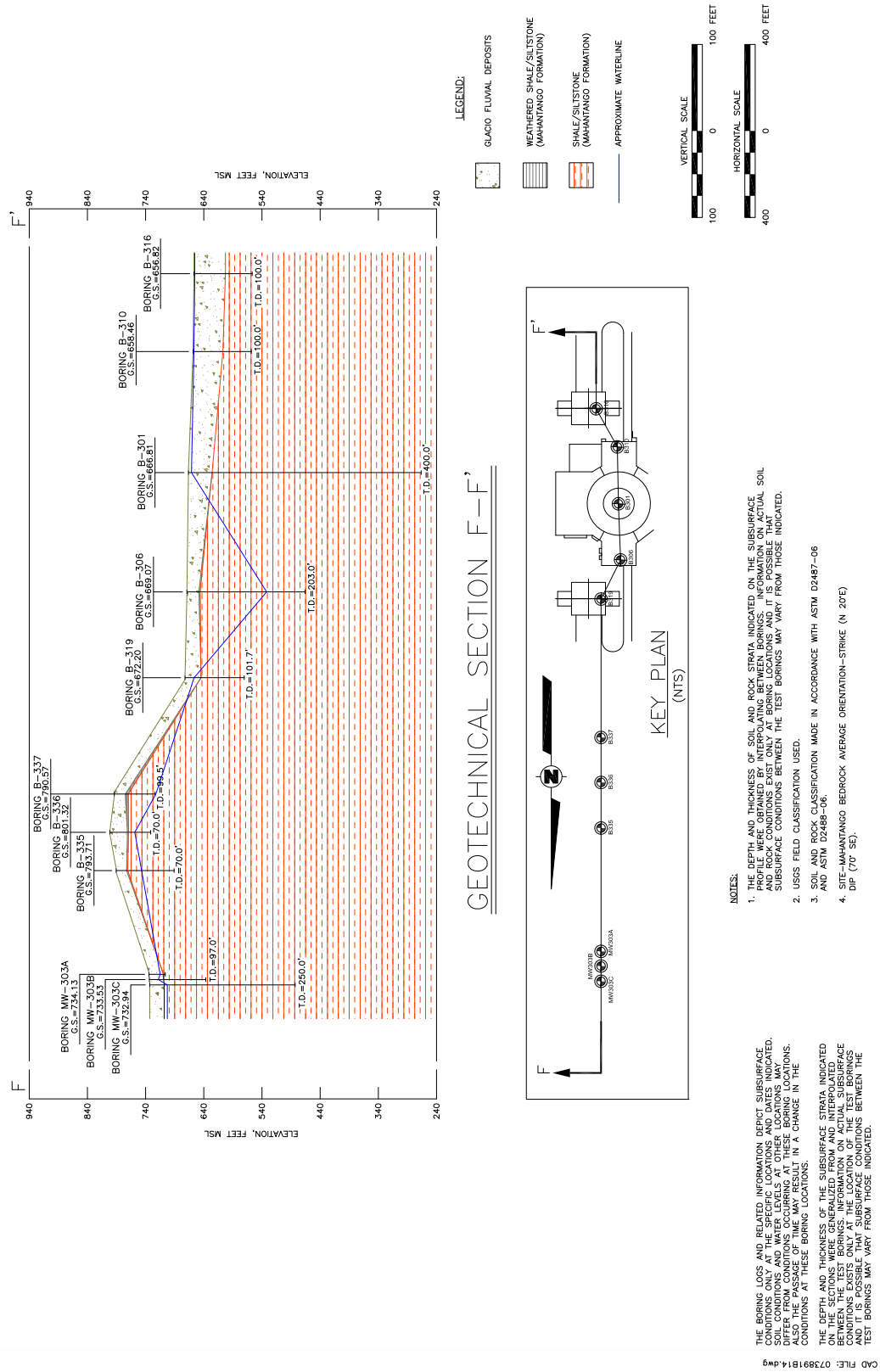


Figure 2.5-34 {Bechtel Group EPRI Source Zones}

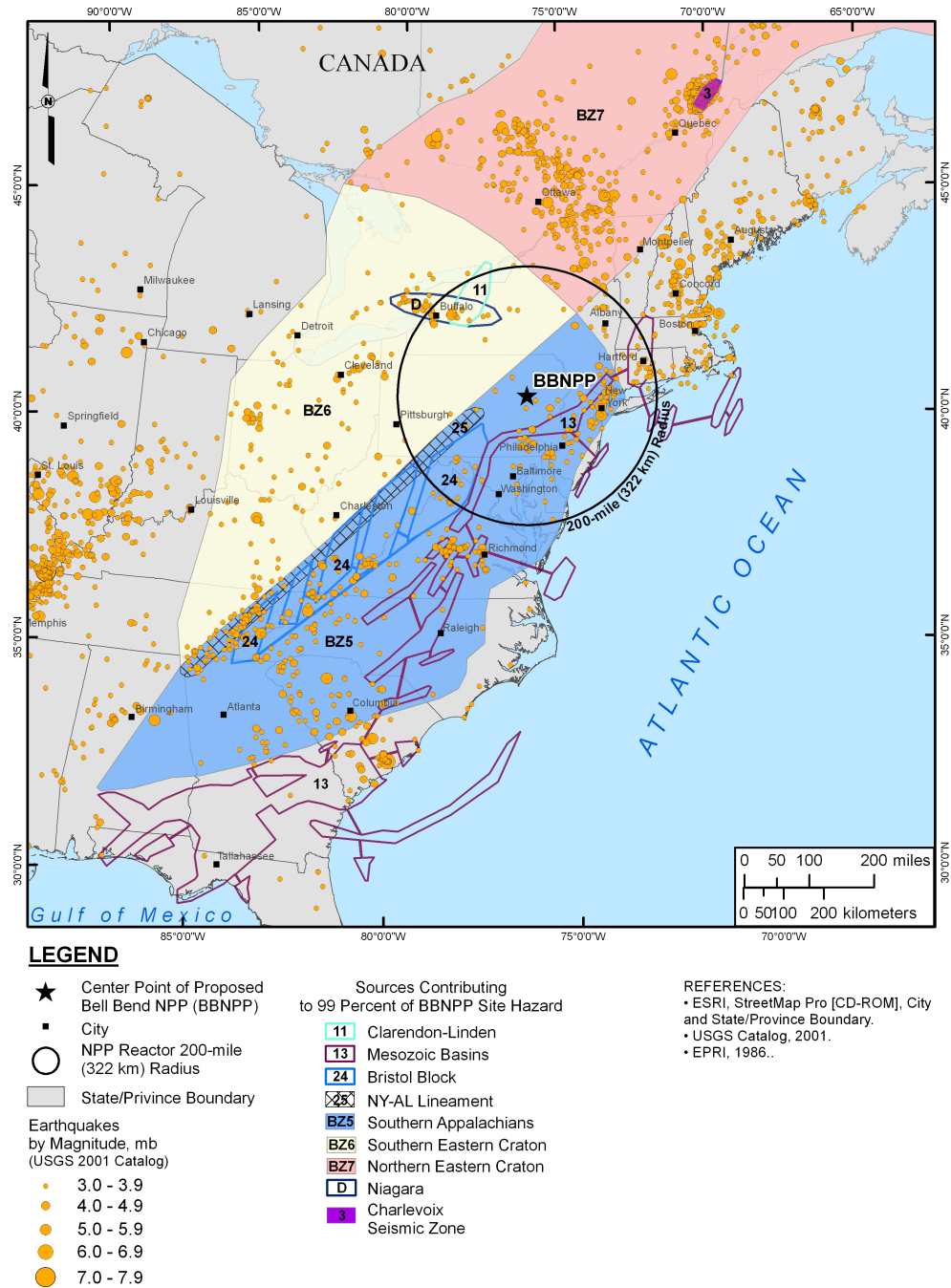


Figure 2.5-35 {Dames & Moore EPRI Source Zones}

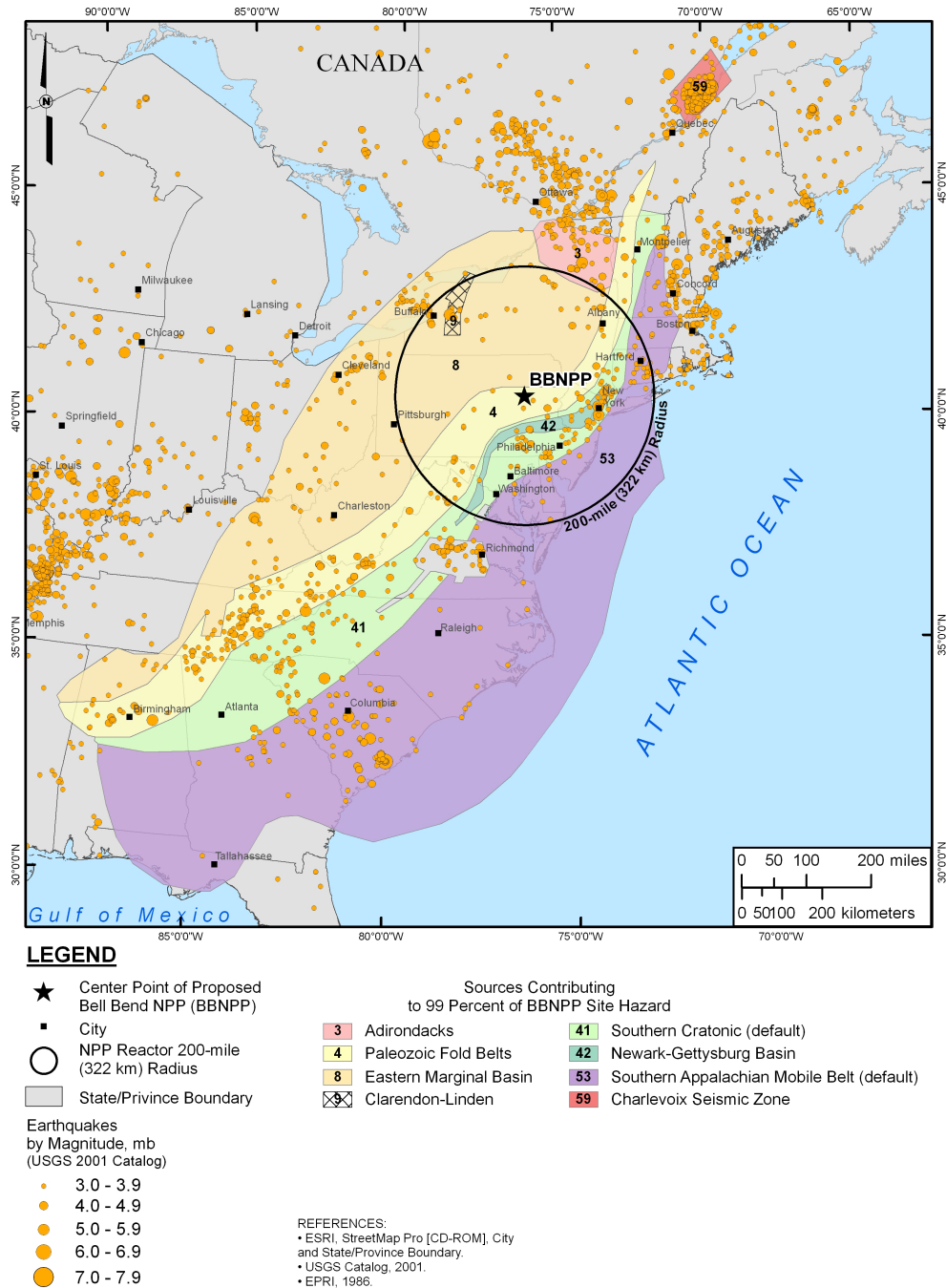


Figure 2.5-36 {Law Engineering EPRI Source Zones}

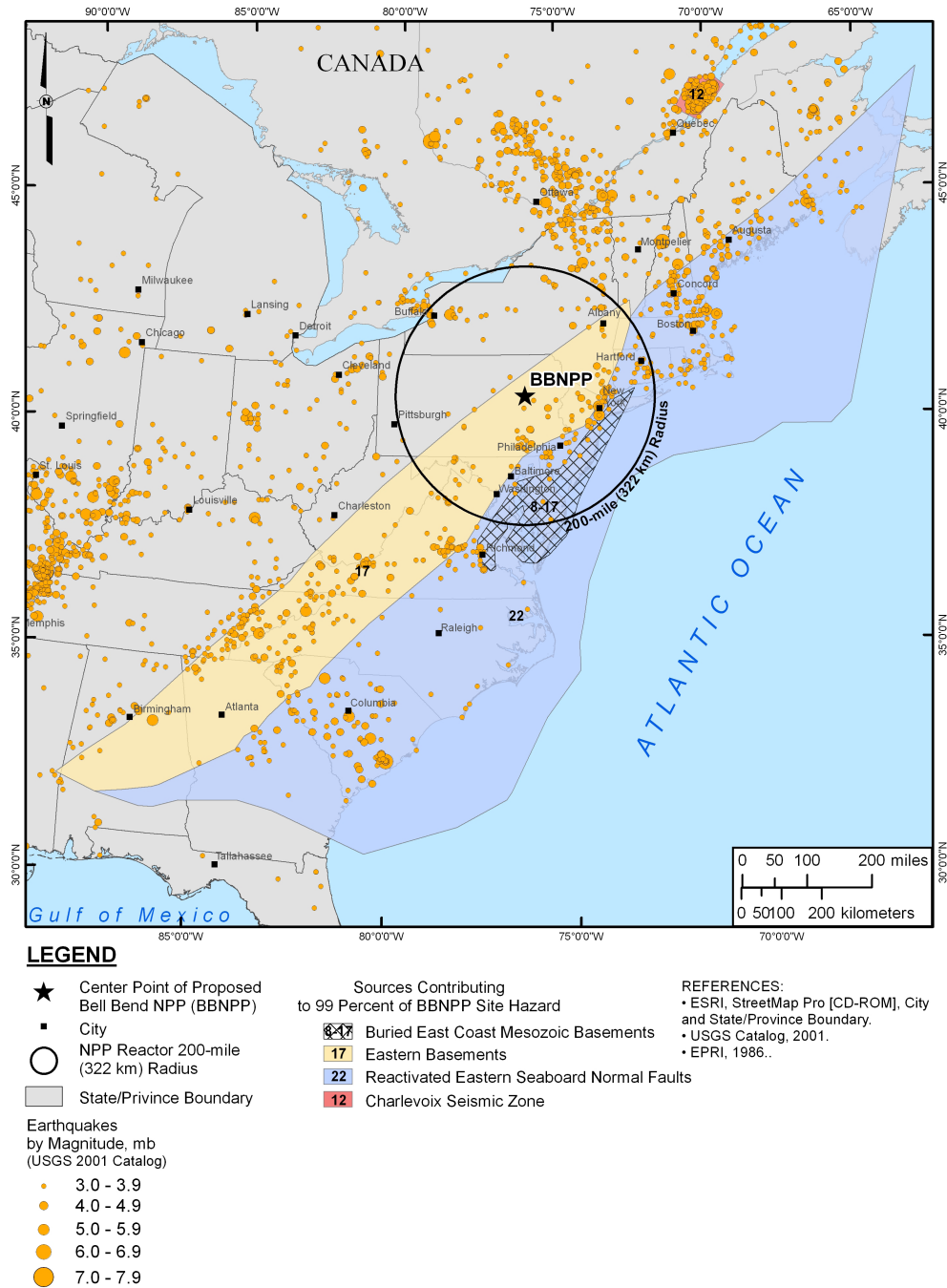


Figure 2.5-37 {Rondout Associates EPRI Source Zones}

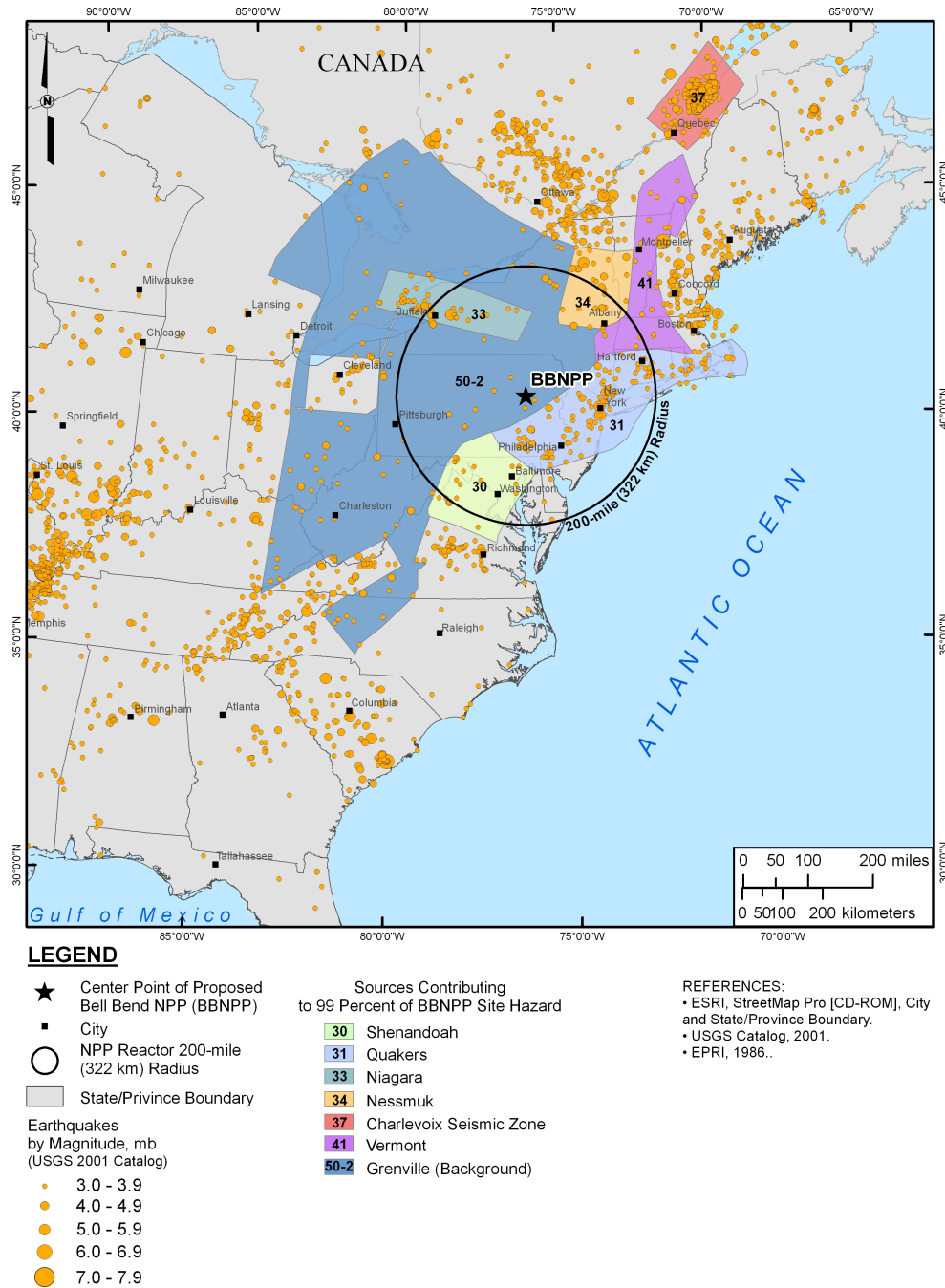


Figure 2.5-38 {Weston Geophysical EPRI Source Zones}

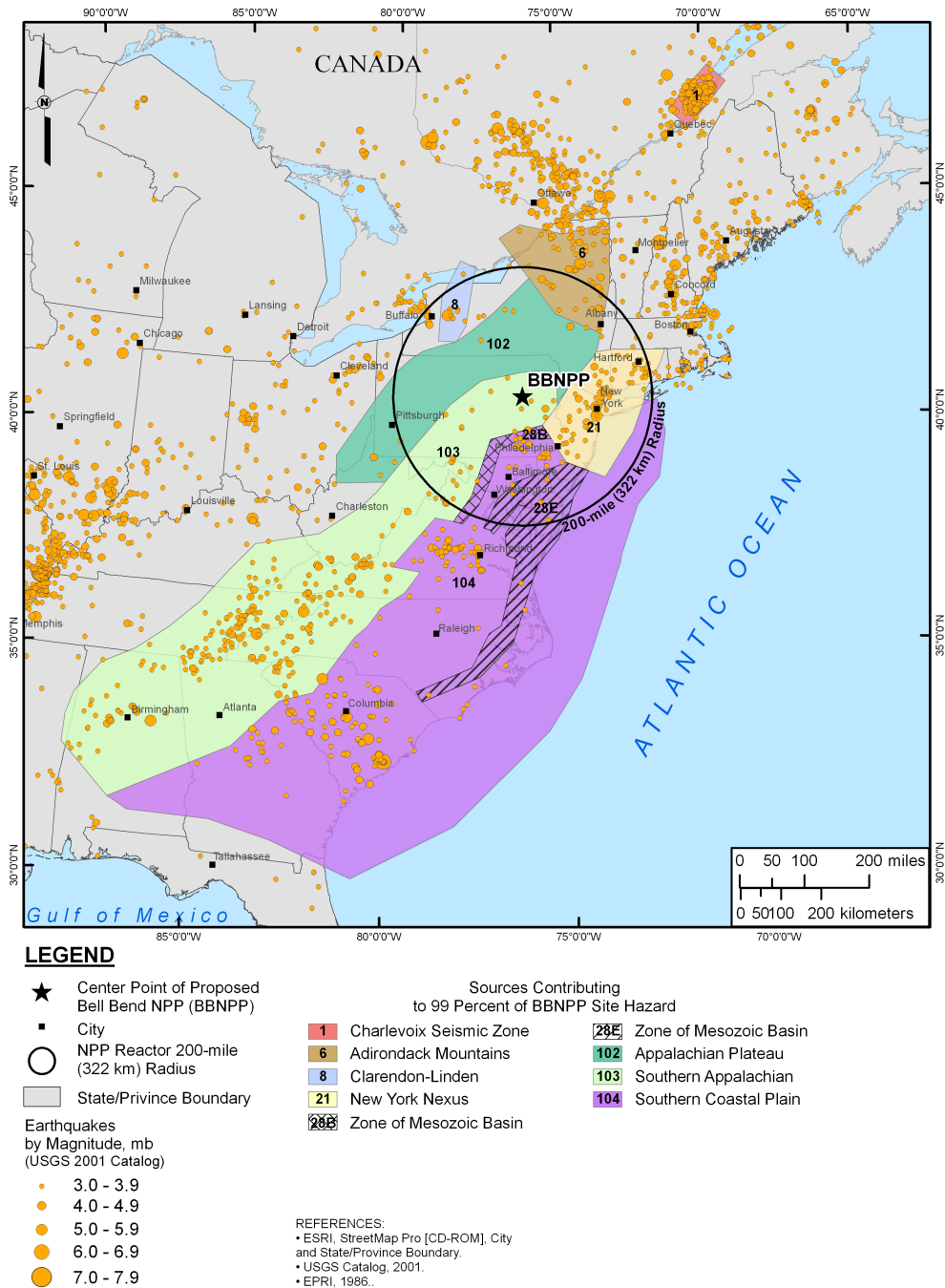
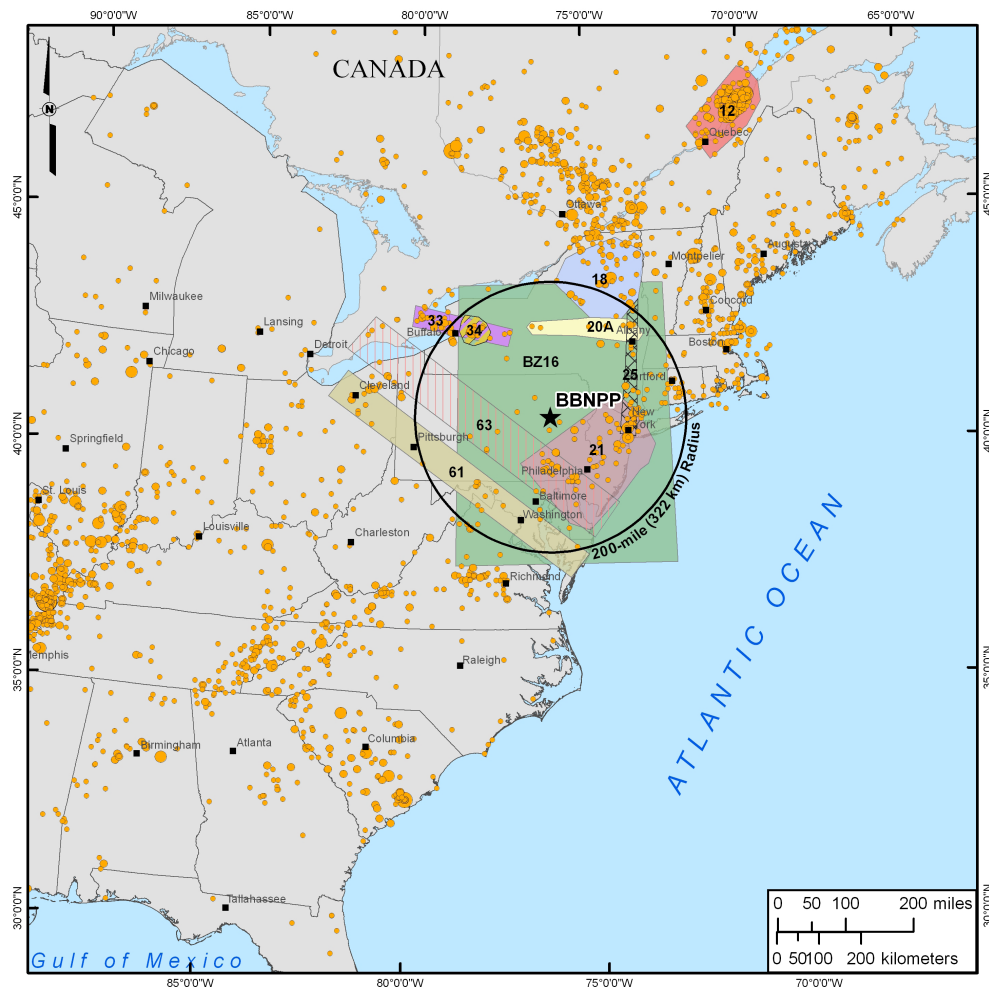


Figure 2.5-39 {Woodward-Clyde Consultants EPRI Source Zones}



LEGEND

★ Center Point of Proposed Bell Bend NPP (BBNPP)

■ City

○ NPP Reactor 200-mile (322 km) Radius

▬ State/Province Boundary

Earthquakes

by Magnitude, mb

(USGS 2001 Catalog)

● 3.0 - 3.9

● 4.0 - 4.9

● 5.0 - 5.9

● 6.0 - 6.9

● 7.0 - 7.9

Sources Contributing to 99 Percent of BBNPP Site Hazard

18 Adirondack Uplift

20A Mohawk River Trend

21 NJ Gravity Saddle

25 Hudson River Trend

33 W. NY-S Ontario Seismic Zone

44 Attica, NY Intersection

63 Pittsburgh-Washington Lineament

BZ16 Susquehanna Background

12 Charlevoix Seismic Zone

61 Tyron-Mt. Union Lineament

REFERENCES:

- ESRI, StreetMap Pro [CD-ROM], City and State/Province Boundary.
- USGS Catalog, 2001.
- EPRI, 1986.

Figure 2.5-40 {Seismic Zones and Seismicity in CEUS}

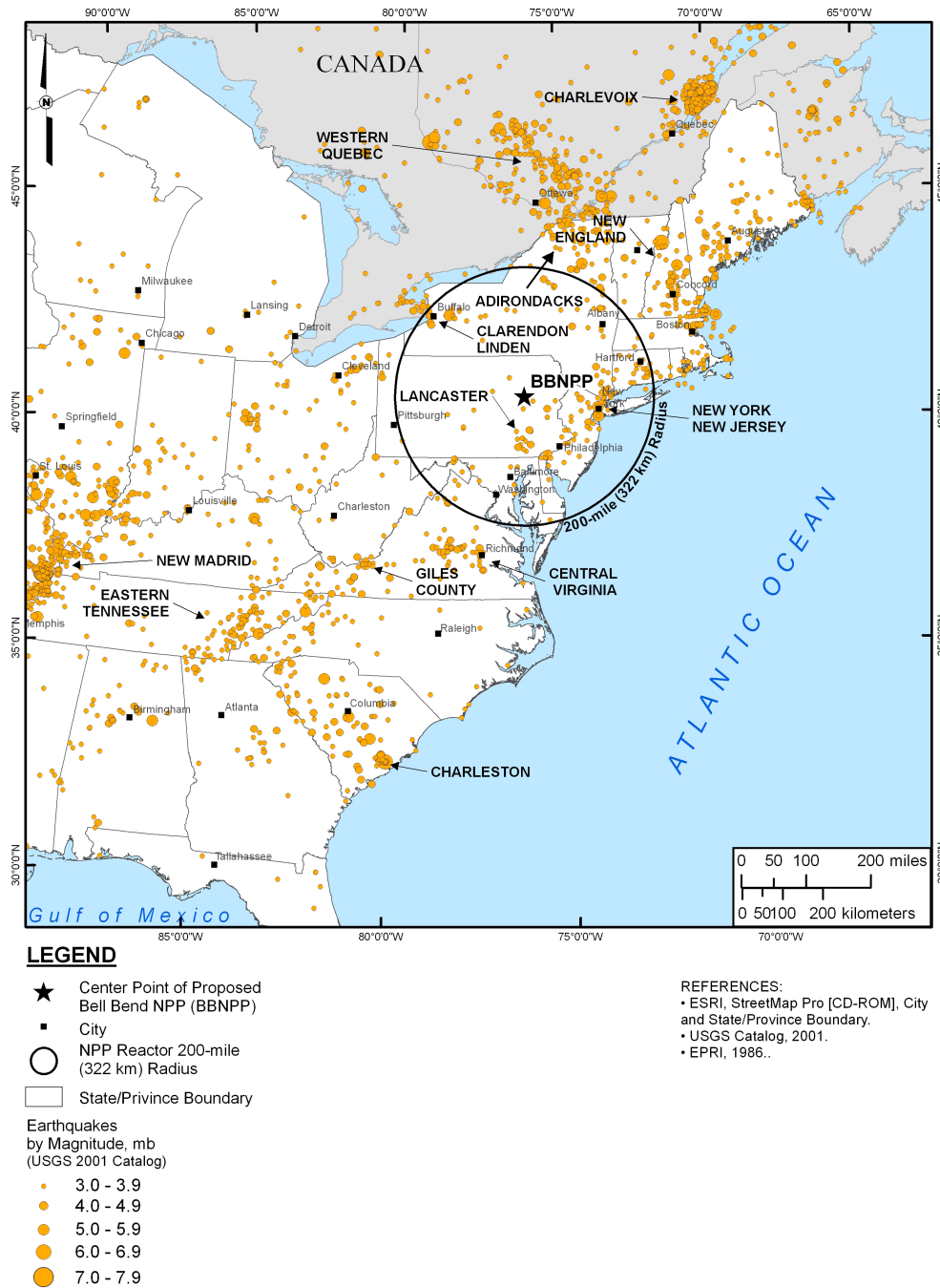
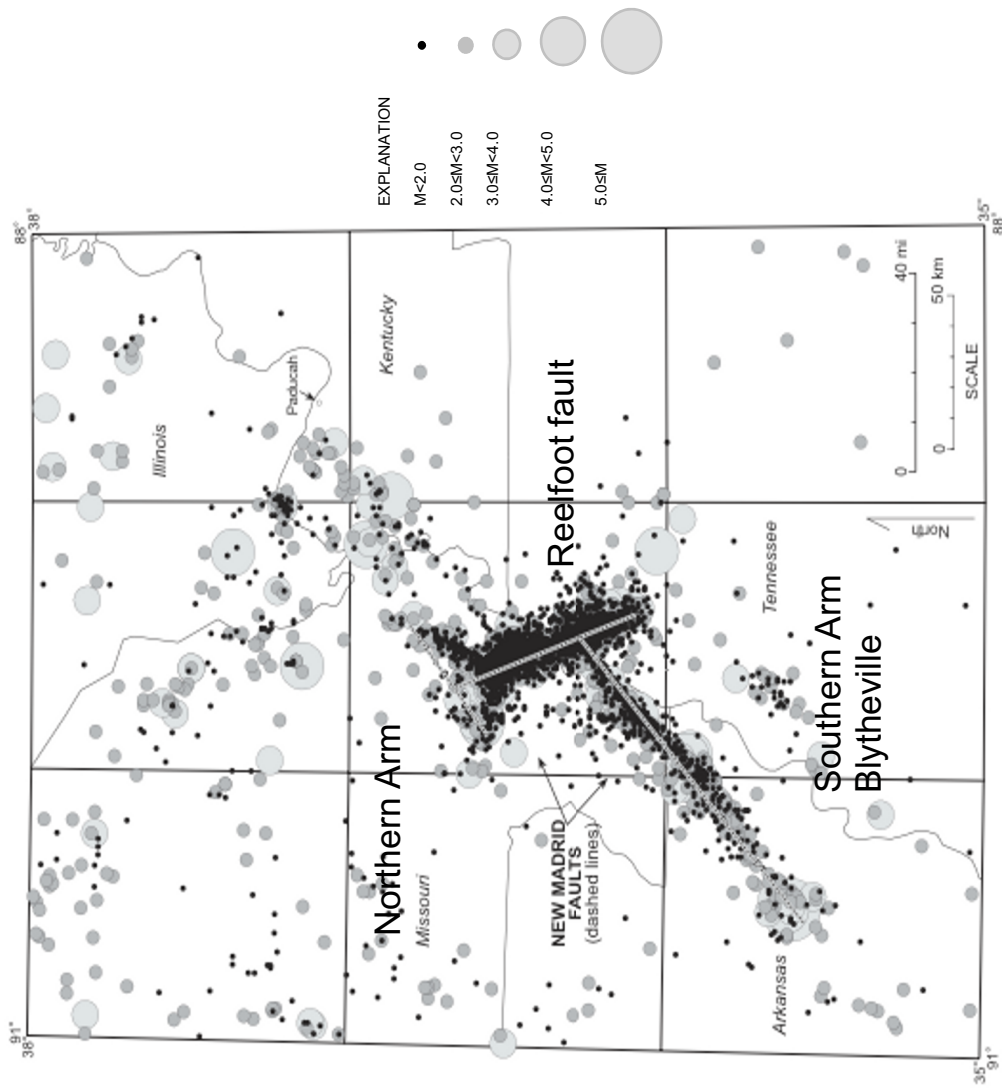
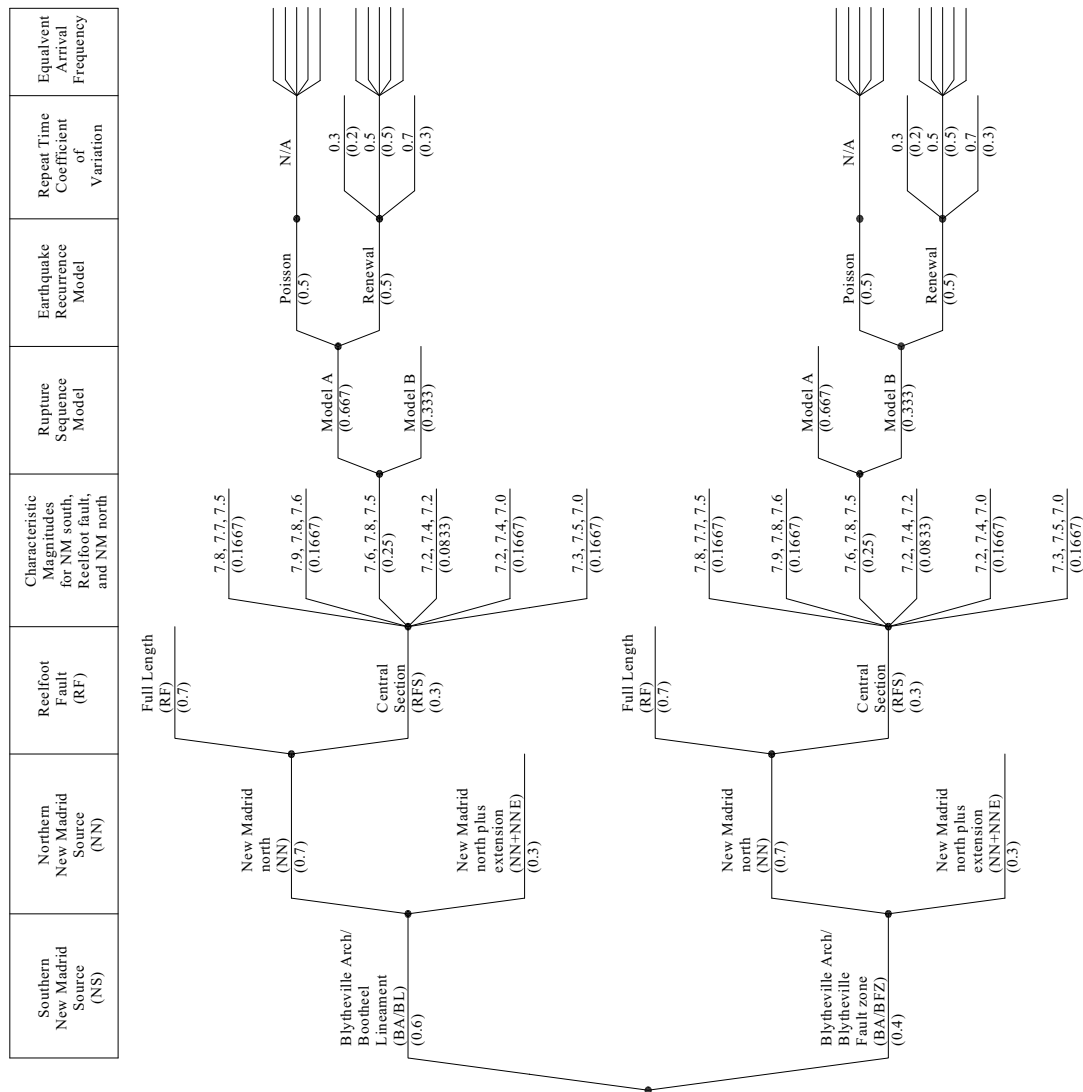


Figure 2.5-41 {System Activity at the New Madrid Fault System}



From USGS Preliminary Documentation for the 2007 Update of the US National Seismic (USGS 2008 Hazard Maps)

Figure 2.5-42 {Logic Tree of New Madrid Fault System}



Adapted from the Seismic Hazards Report for the Clinton ESP Site .
See Figure 4.1-1 of Appendix B (EGC 2006)

Figure 2.5-43 {Uniform Hazard Spectra for Hard Rock at 7 Structural Frequencies}

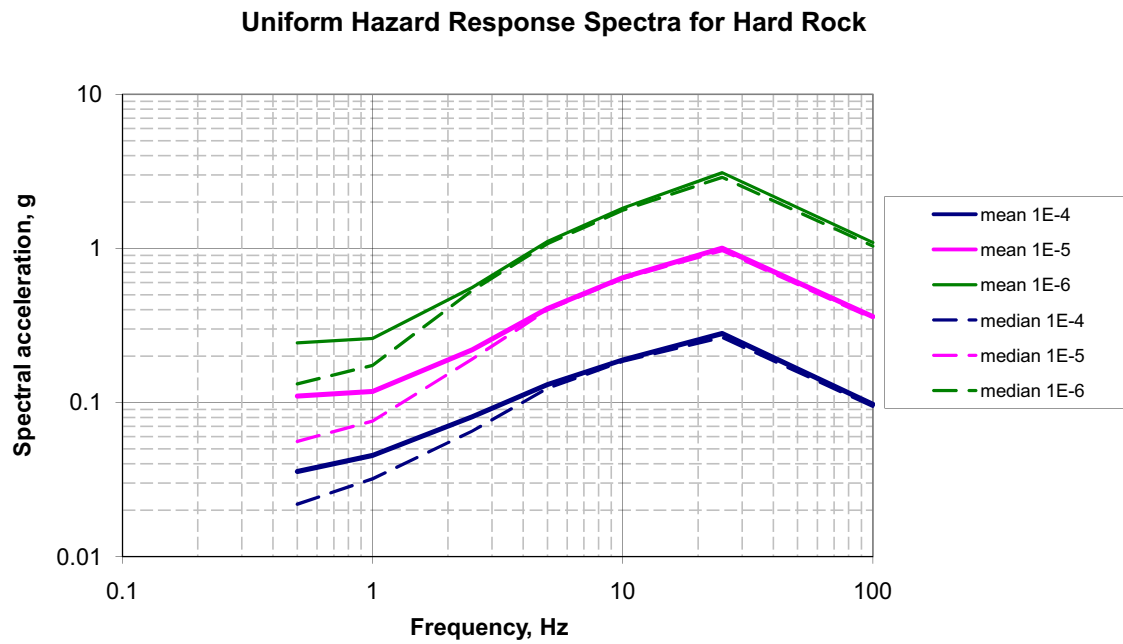
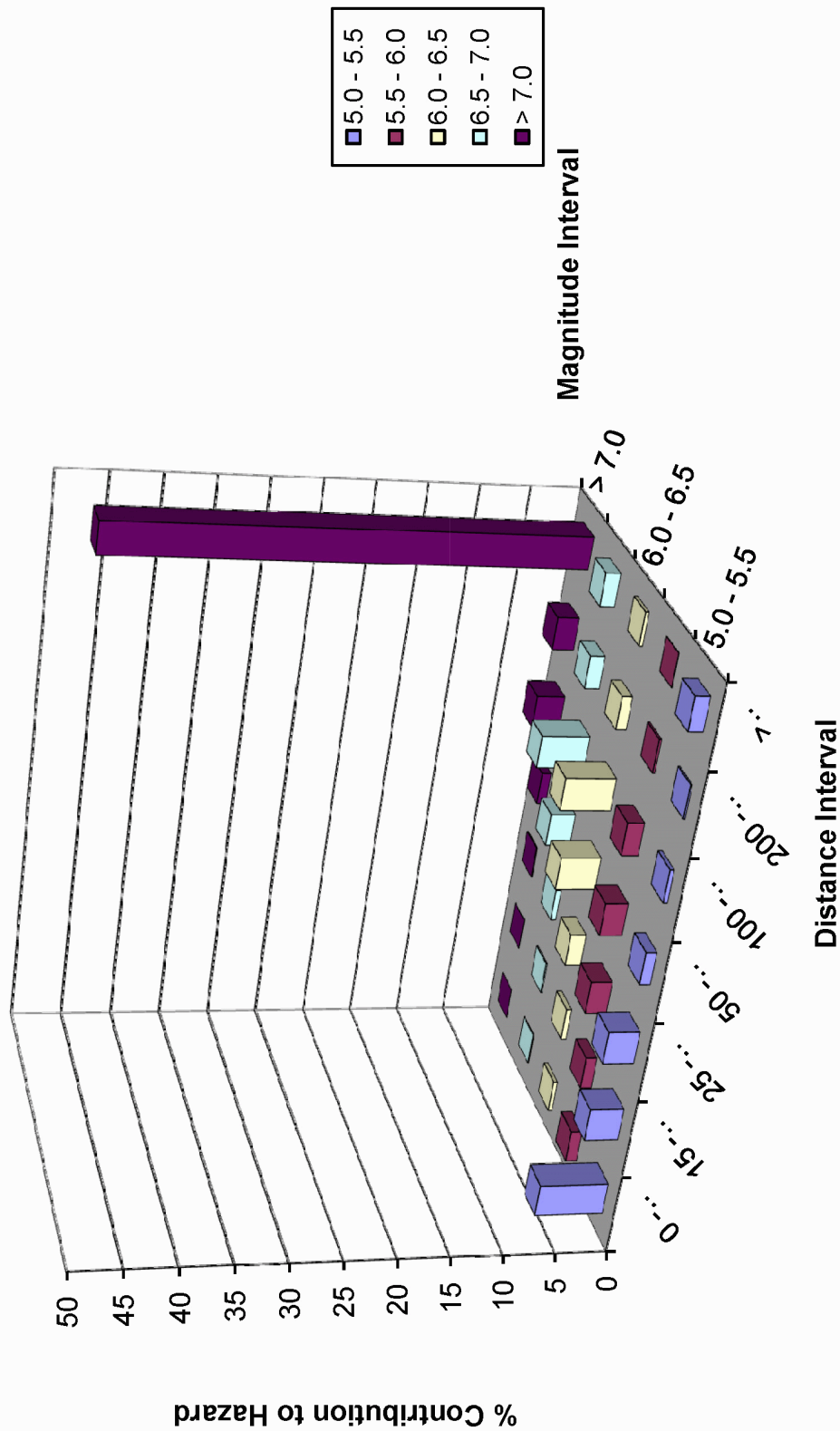
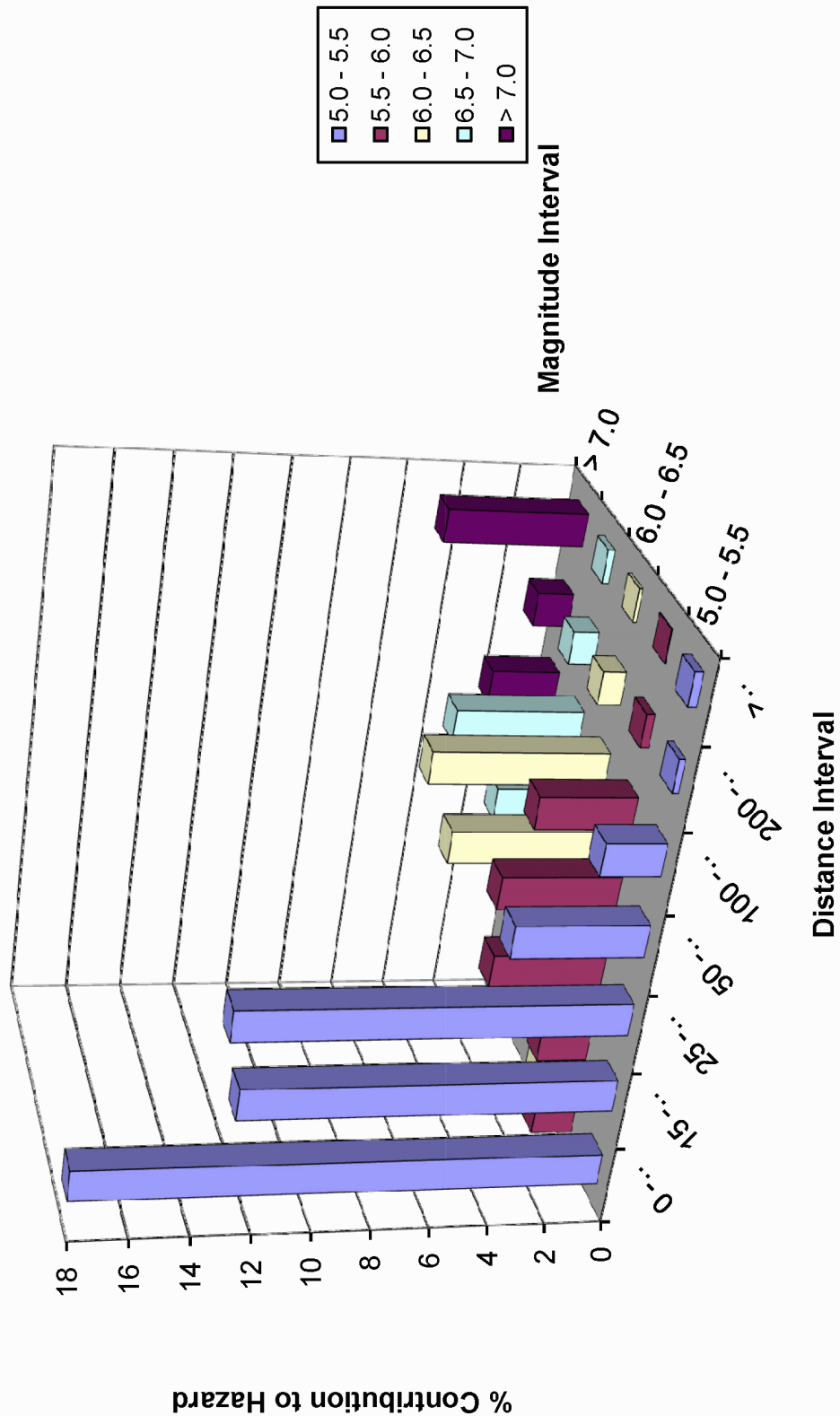


Figure 2.5-44 {Mean 10^{-4} Rock Deaggregation for 1 and 2.5 Hz}



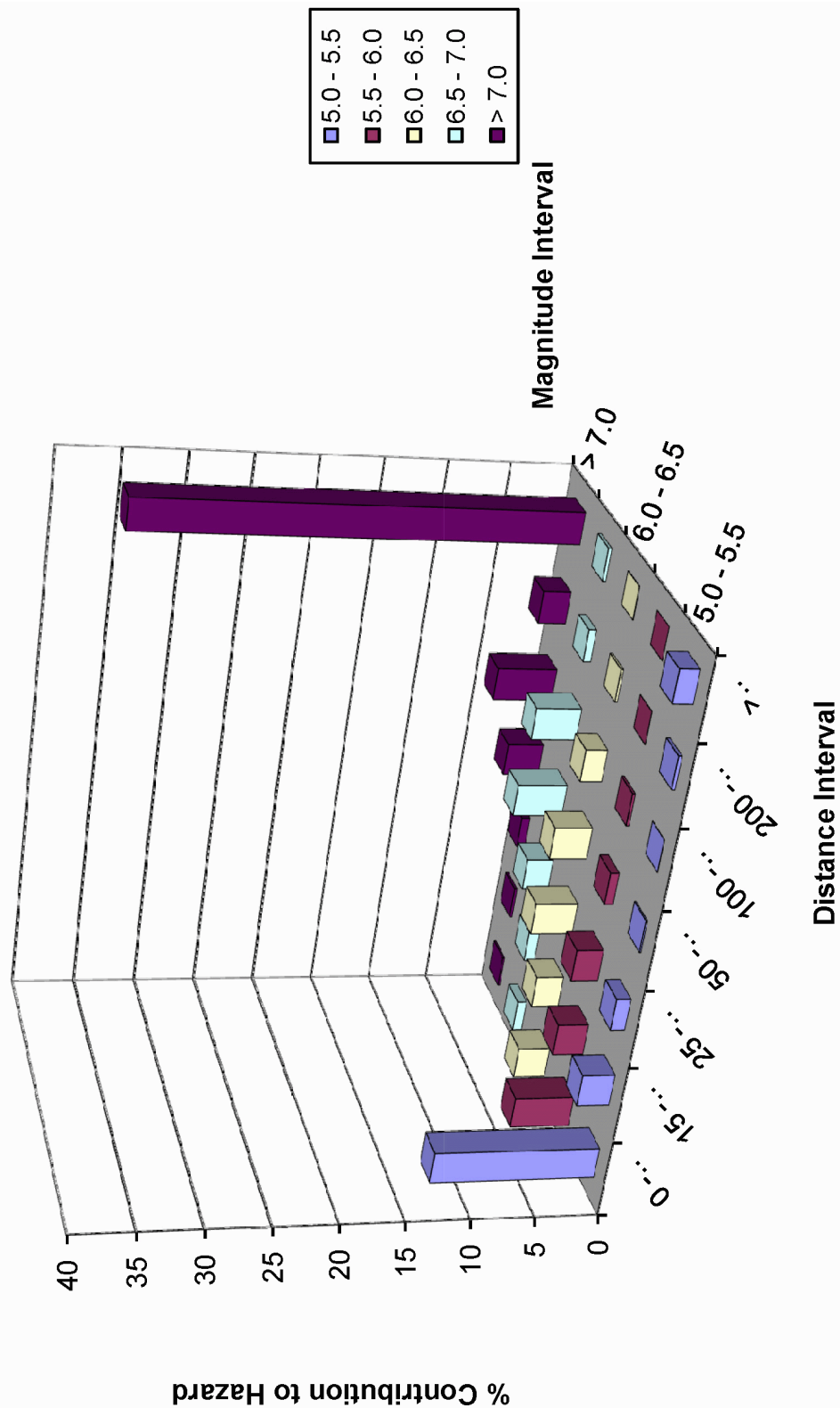
Hazard from events farther than 300 km (187.5 mi) is plotted in the > 300 km (187.5 mi) bins. These contributions are from the New Madrid Characteristic Earthquake.

Figure 2.5-45 {Mean 10^{-4} Rock Deaggregation for 5 and 10 Hz}



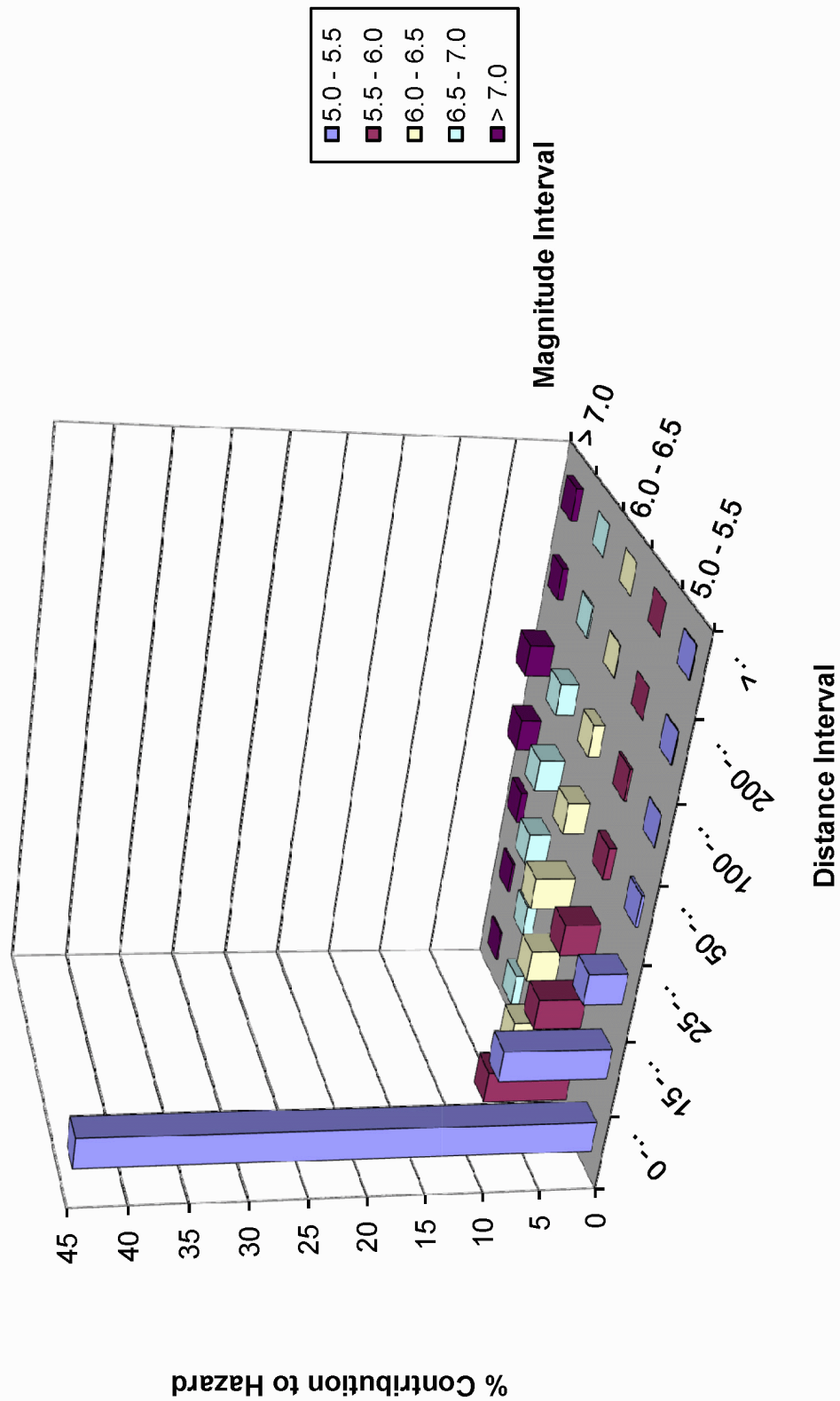
Hazard from events farther than 300 km (187.5 mi) is plotted in the > 300 km (187.5 mi) bins. These contributions are from the New Madrid Characteristic Earthquake.

Figure 2.5-46 {Mean 10^{-5} Rock Deaggregation for 1 and 2.5 Hz}



Hazard from events farther than 300 km (187.5 mi) is plotted in the > 300 km (187.5 mi) bins. These contributions are from the New Madrid Characteristic Earthquake.

Figure 2.5-47 {Mean 10^{-5} Rock Deaggregation for 5 and 10 Hz}



Hazard from events farther than 300 km (187.5 mi) is plotted in the > 300 km (187.5 mi) bins. These contributions are from the New Madrid Characteristic Earthquake.

Figure 2.5-48 { 10^{-4} Smooth Hard Rock UHRS Spectra}

10^{-4} Smooth Mean Uniform Hazard Response Spectra for Hard Rock

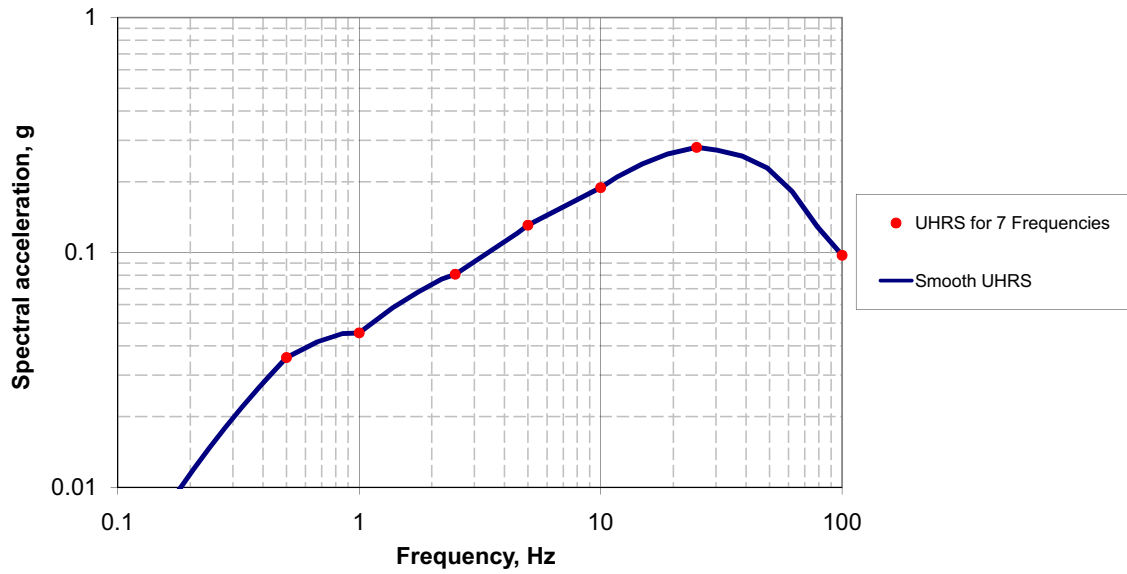


Figure 2.5-49 { 10^{-5} Smooth Hard Rock UHRS Spectra}

10^{-5} Smooth Mean Uniform Hazard Response Spectra for Hard Rock

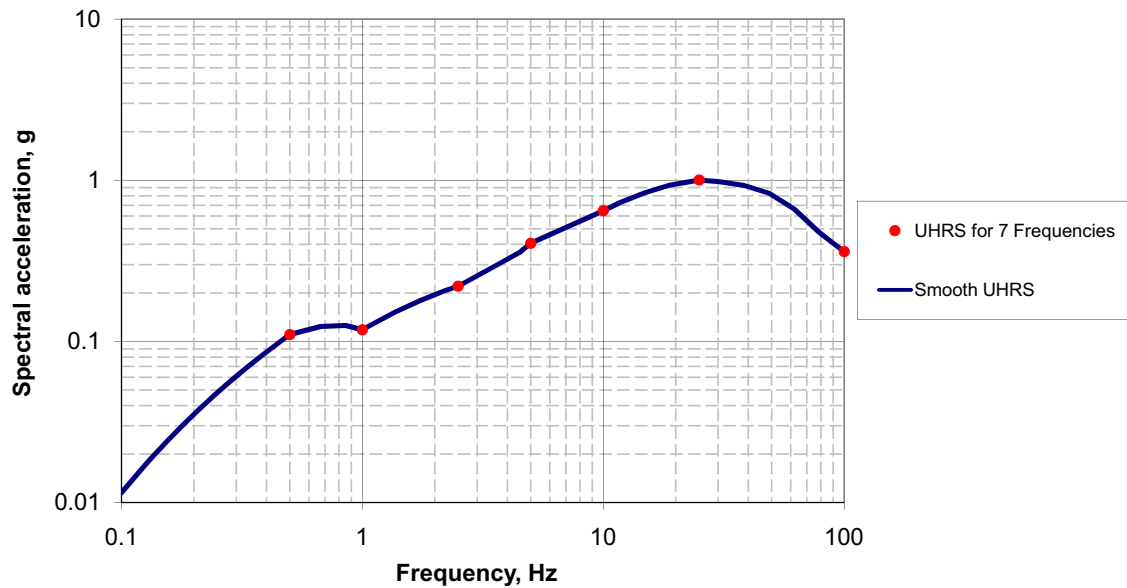


Figure 2.5-50 {Shear-Wave Velocity V_s and its Coefficient of Variation for Depth to 350 ft (107 m)}

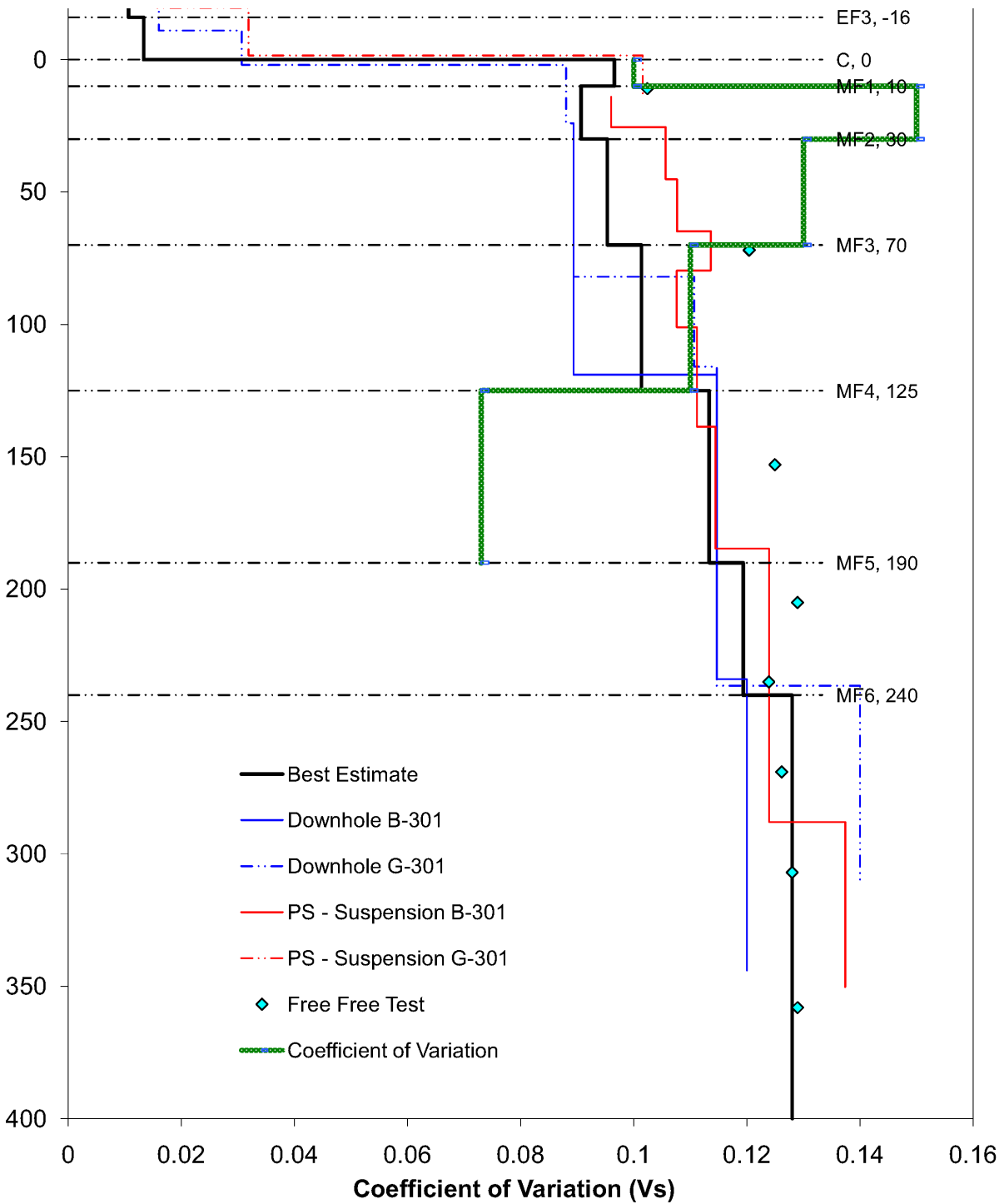


Figure 2.5-51 {Best Estimate Shear-Wave Velocity V_s and its Coefficient of Variation for Depth to 190 ft (57.9 m)}

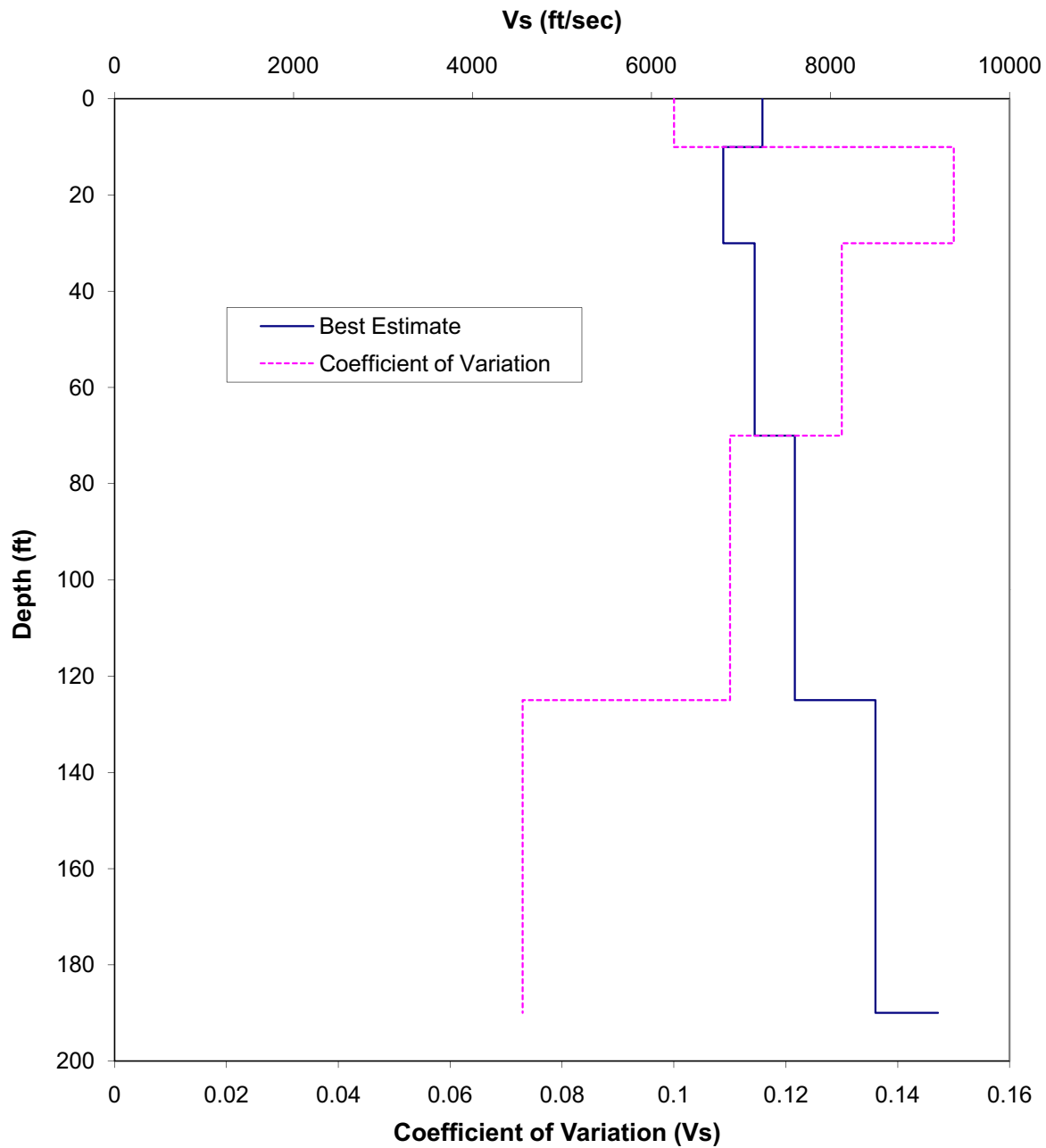


Figure 2.5-52 {Shear-wave Velocity Vs. Depth for Profiles 1 through 60}

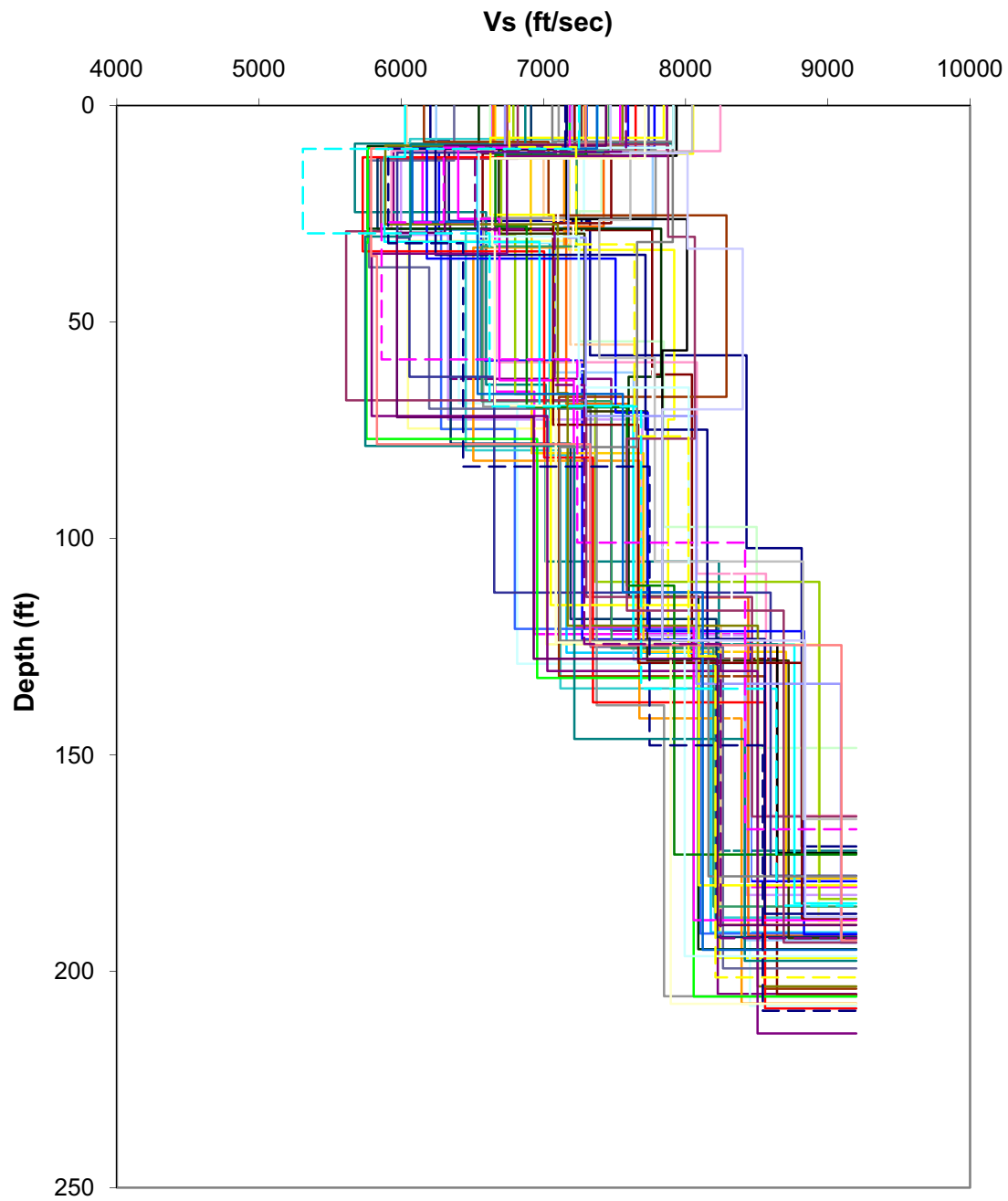


Figure 2.5-53 {Mean $\pm$ Standard Deviation of Shear-wave Velocity (V_s) Vs. Depth for all 60 Profiles, Compared to Best Estimate Profile described in Section 2.5.2.5.1.2}

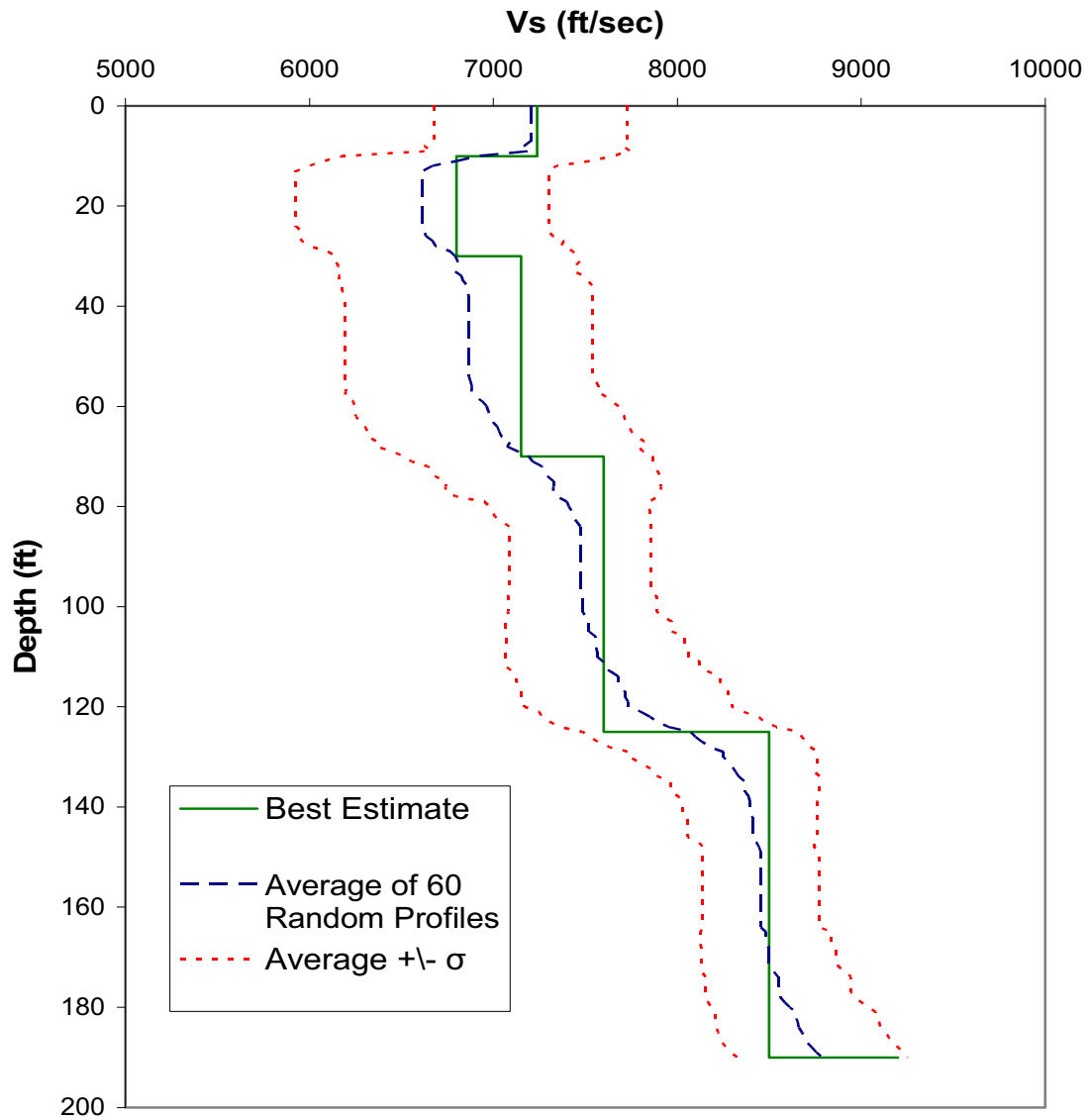


Figure 2.5-54 {G/G_{max} Curves Representing Uncertainty in Damping for Layer: Backfill within Depth 0-20 ft}

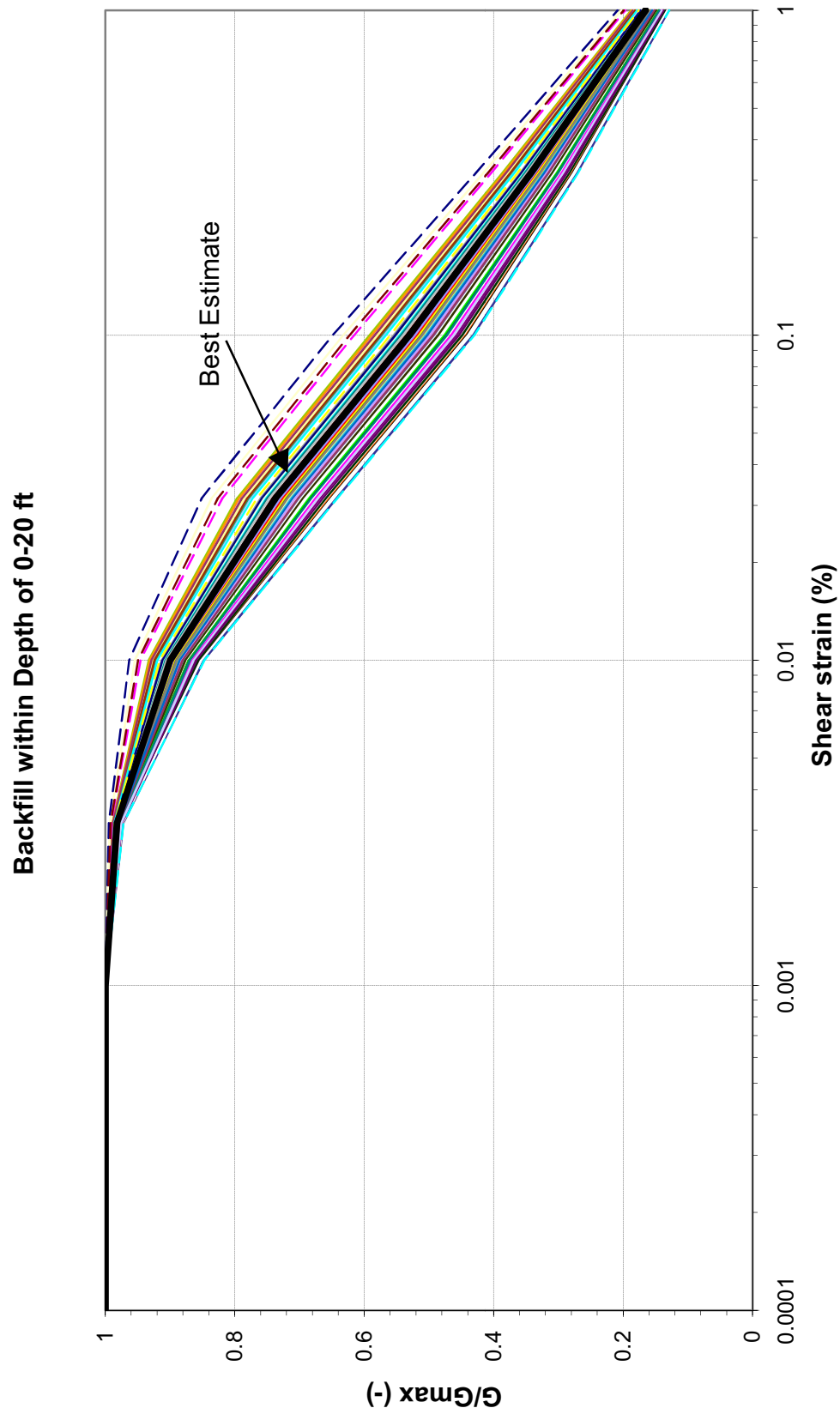


Figure 2.5-55 {Damping Curves Representing Uncertainty in Damping for Layer Backfill within Depth 0-20 ft}

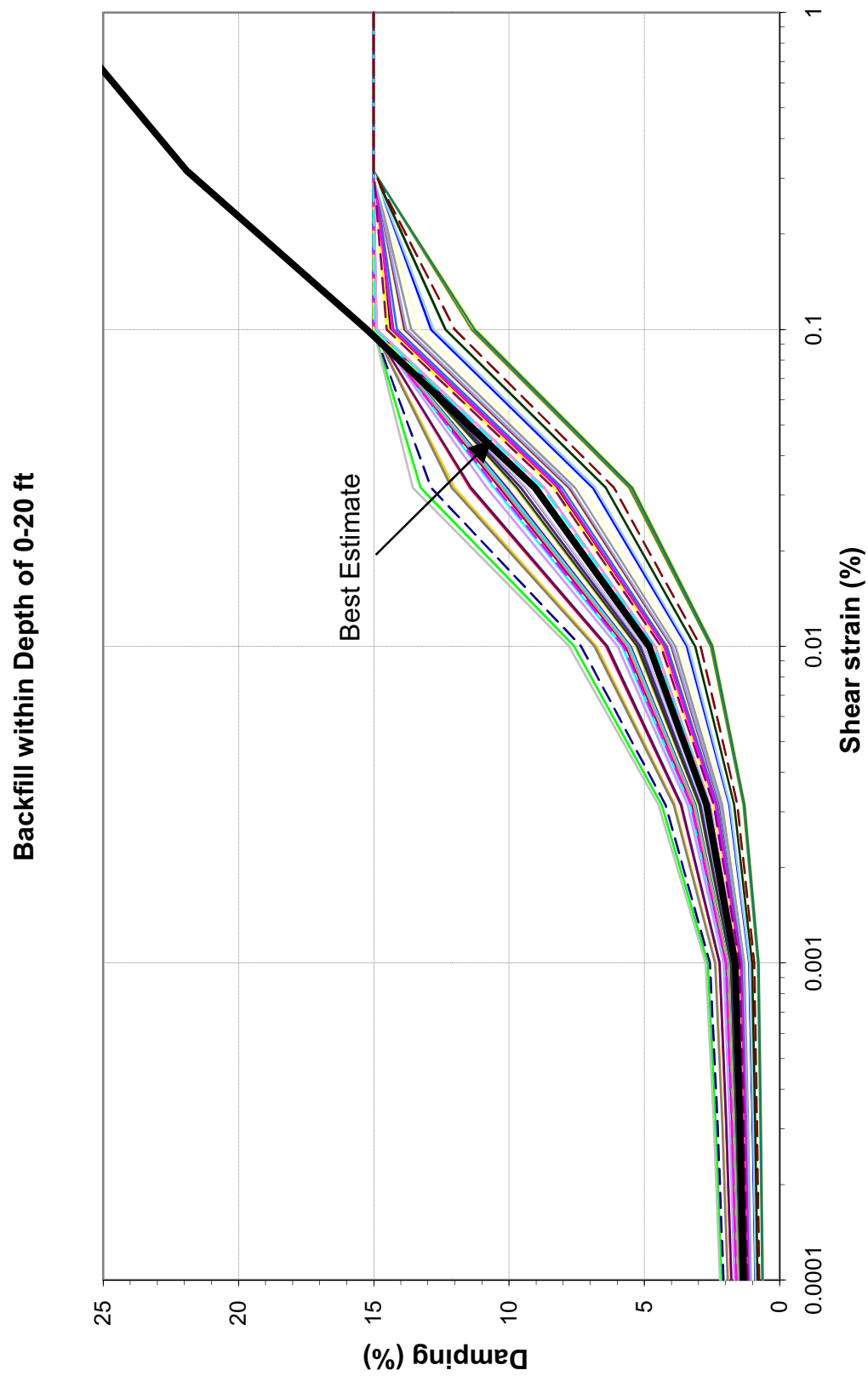


Figure 2.5-56 {Mean Site Amplification Factor and Coefficient of Variation at the Top of Concrete for 10-4 HF DEM Input Motion}

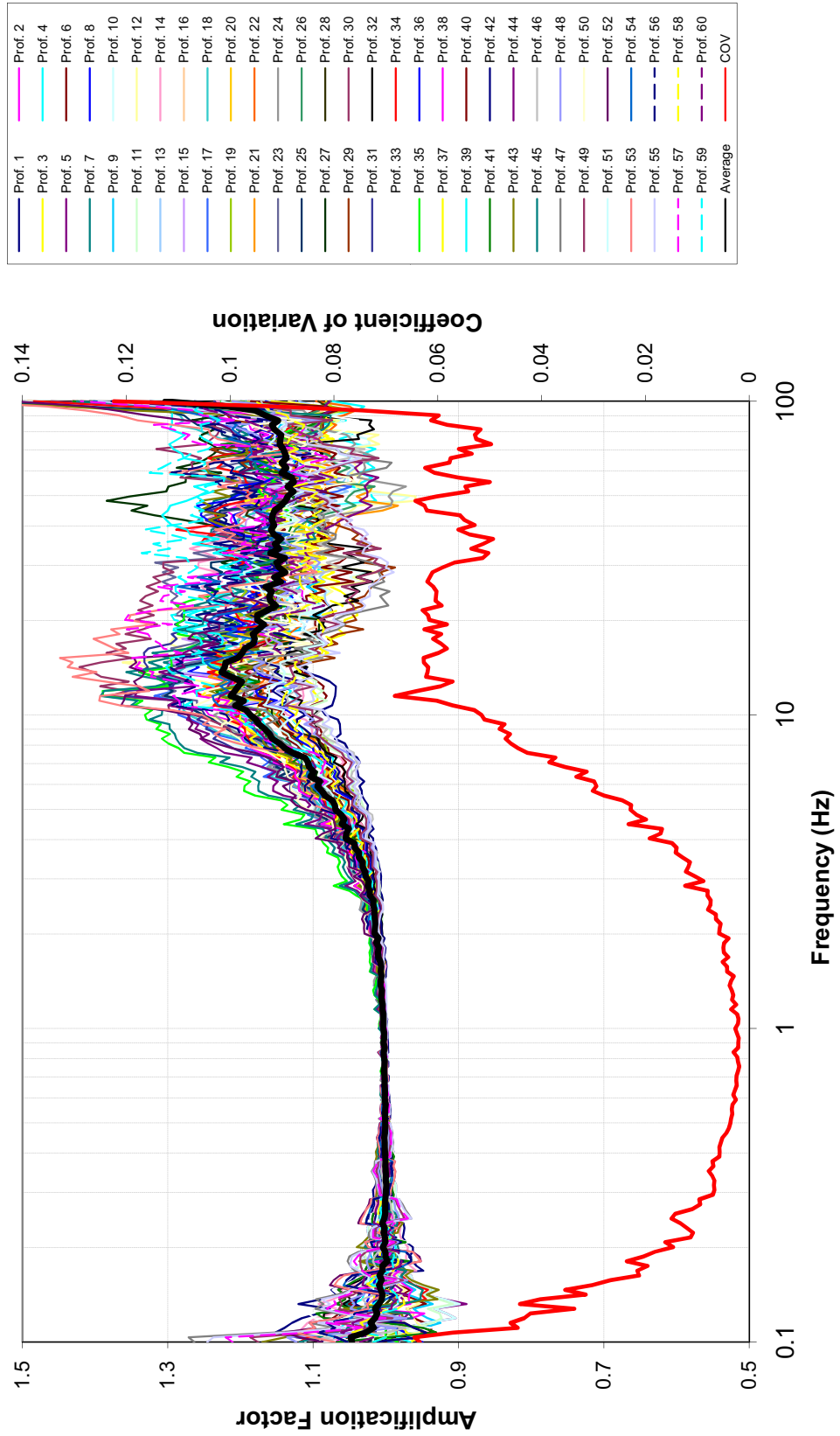


Figure 2.5-57 {Maximum Strains Vs. Depth for 10^{-4} HF DEM Input Motion}

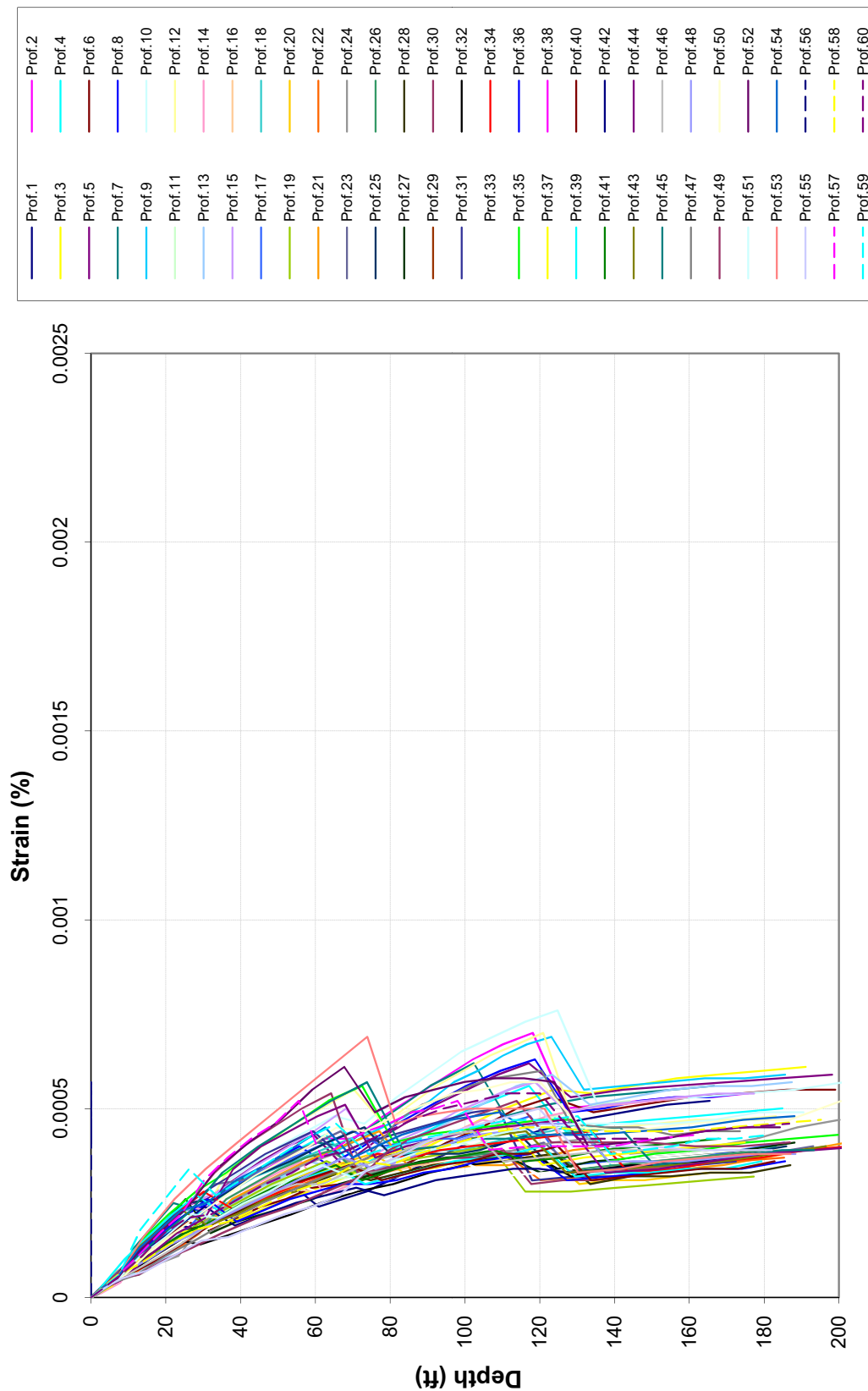


Figure 2.5-58 {Mean Site Amplification Factor and Coefficient of Variation at the Top of Concrete for 10^{-4} LF DEM Input Motion}

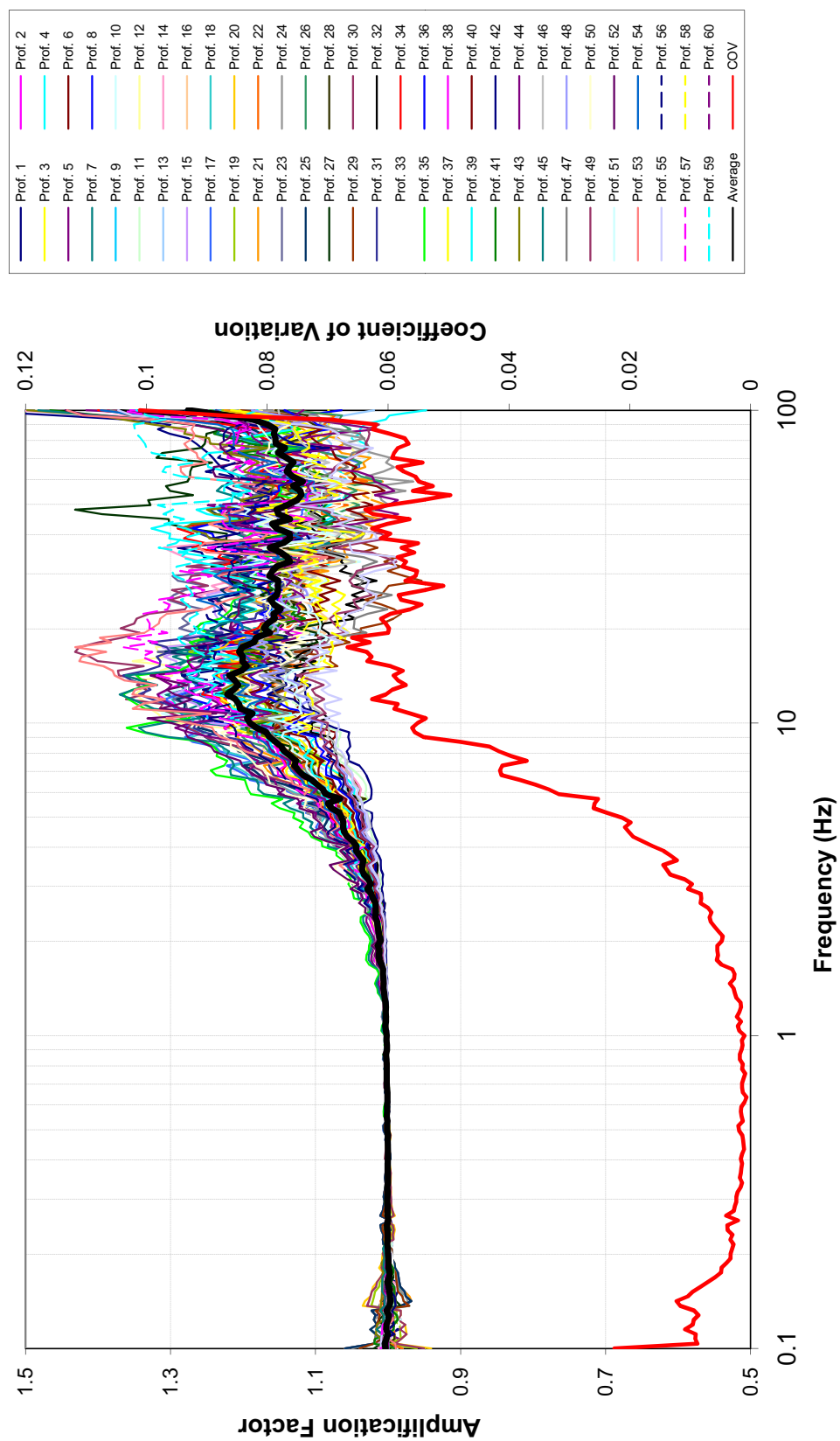


Figure 2.5-59 {Maximum Strains Vs. Depth for 10⁻⁴ LF DEM Input Motion}

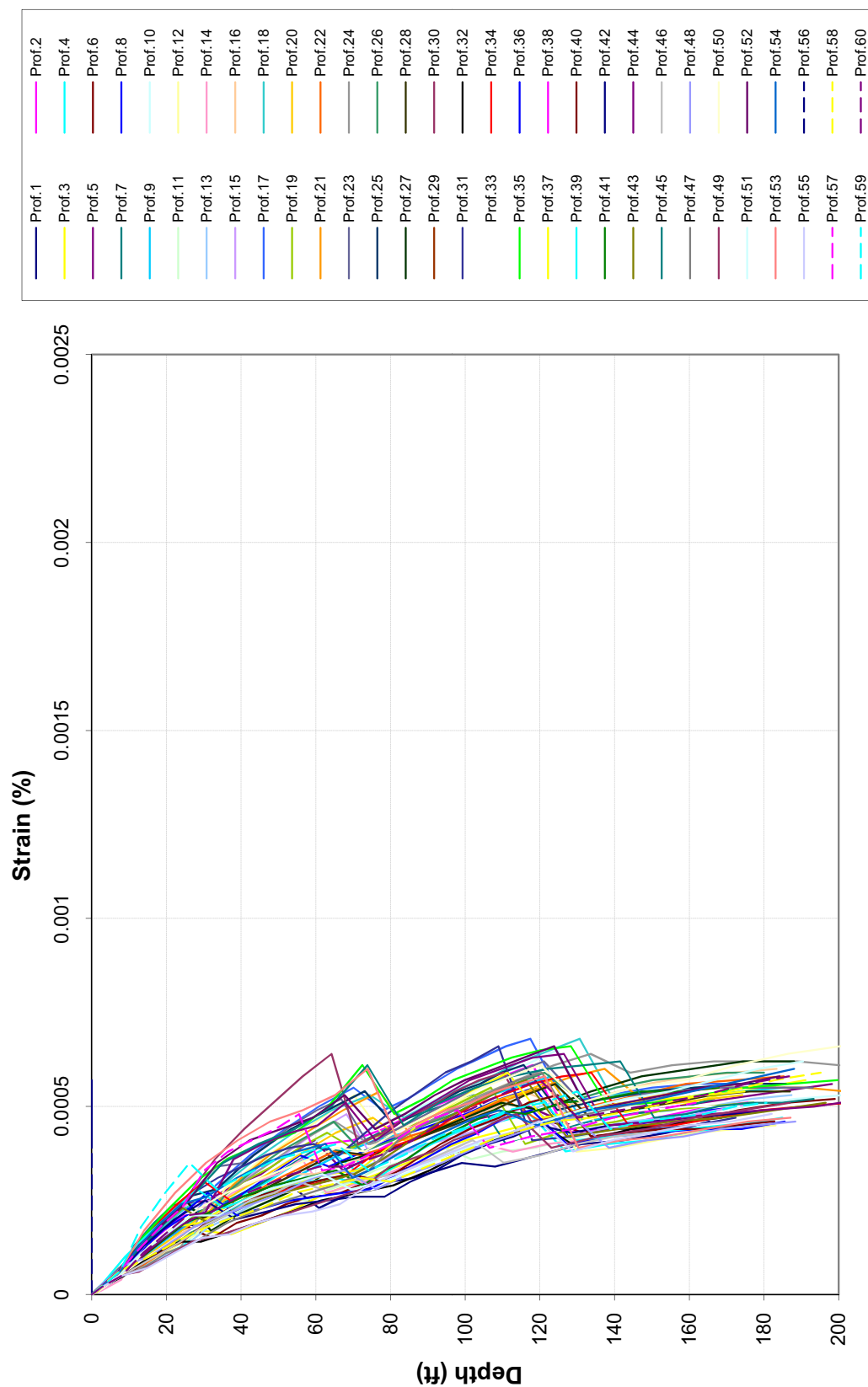


Figure 2.5-60 {Mean Site Amplification Factor and Coefficient of Variation at the Top of Concrete for 10⁻⁵ HF DEM Input Motion}

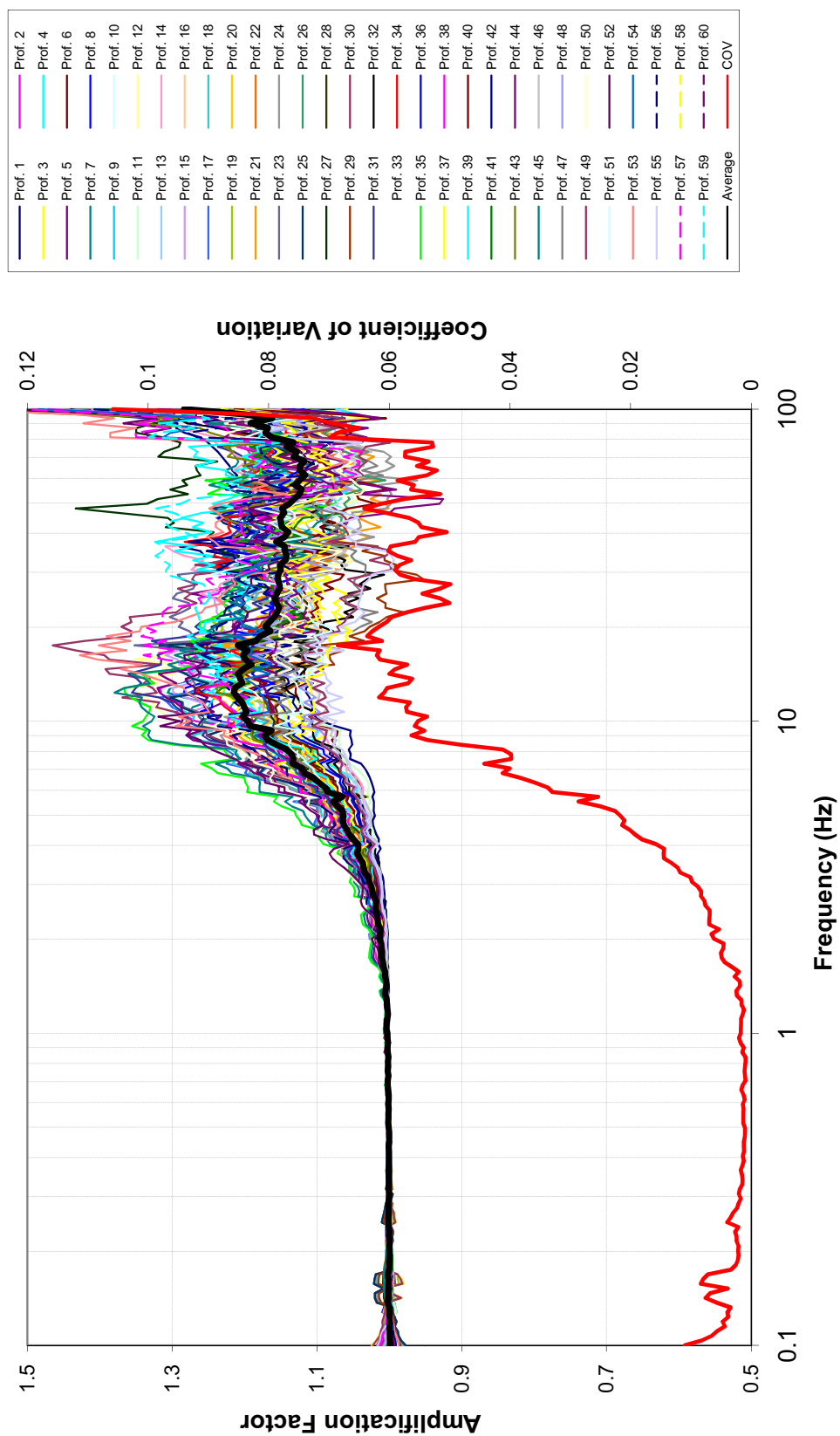


Figure 2.5-61 {Maximum Strains Vs. Depth for 10⁻⁵ HF DEM Input Motion}

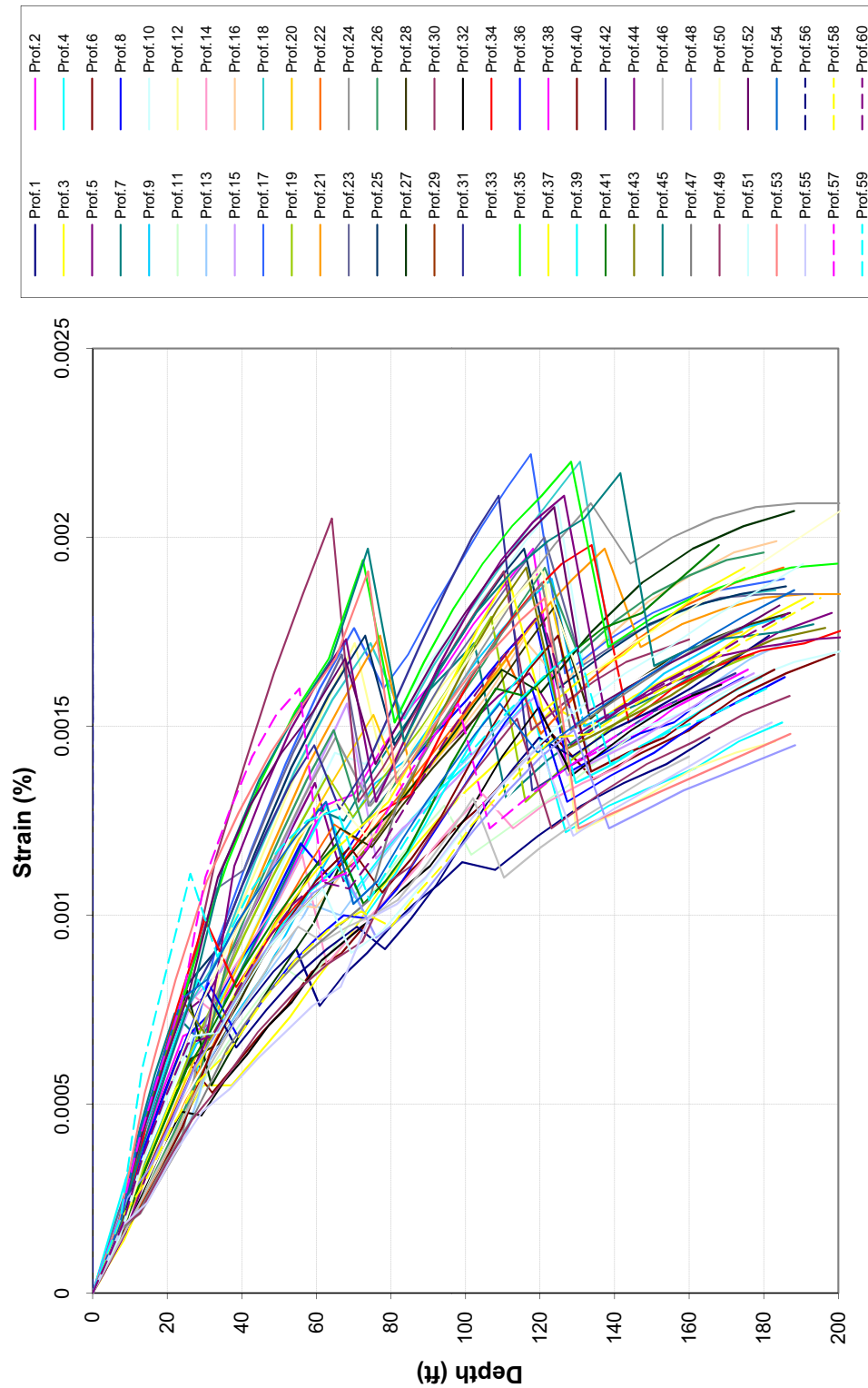


Figure 2.5-62 {Mean Site Amplification Factor and Coefficient of Variation at the Top of Concrete for 10⁻⁵ LF DEM Input Motion}

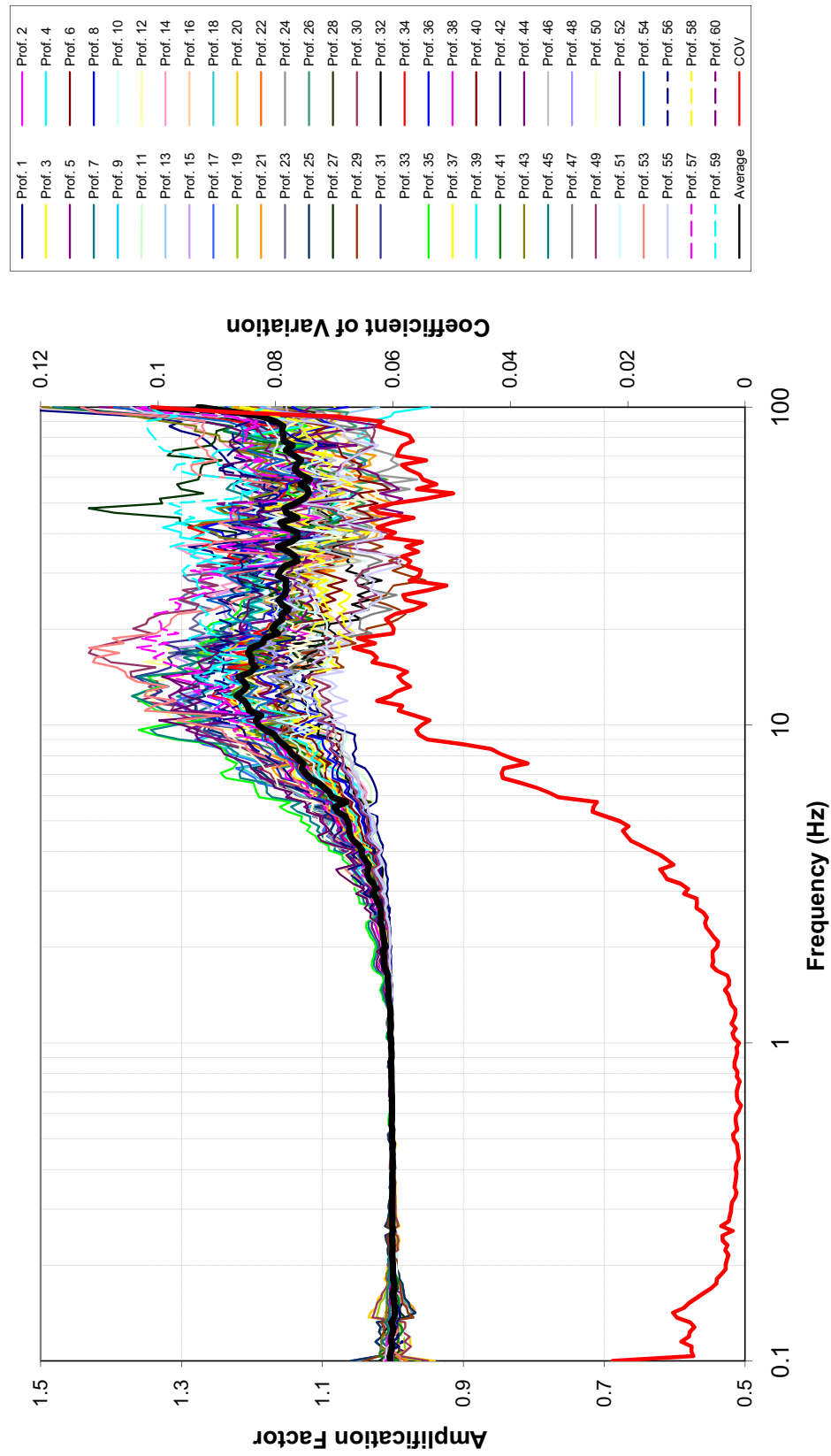


Figure 2.5-63 {Maximum Strains Vs. Depth for 10⁻⁵ LF DEM Input Motion}

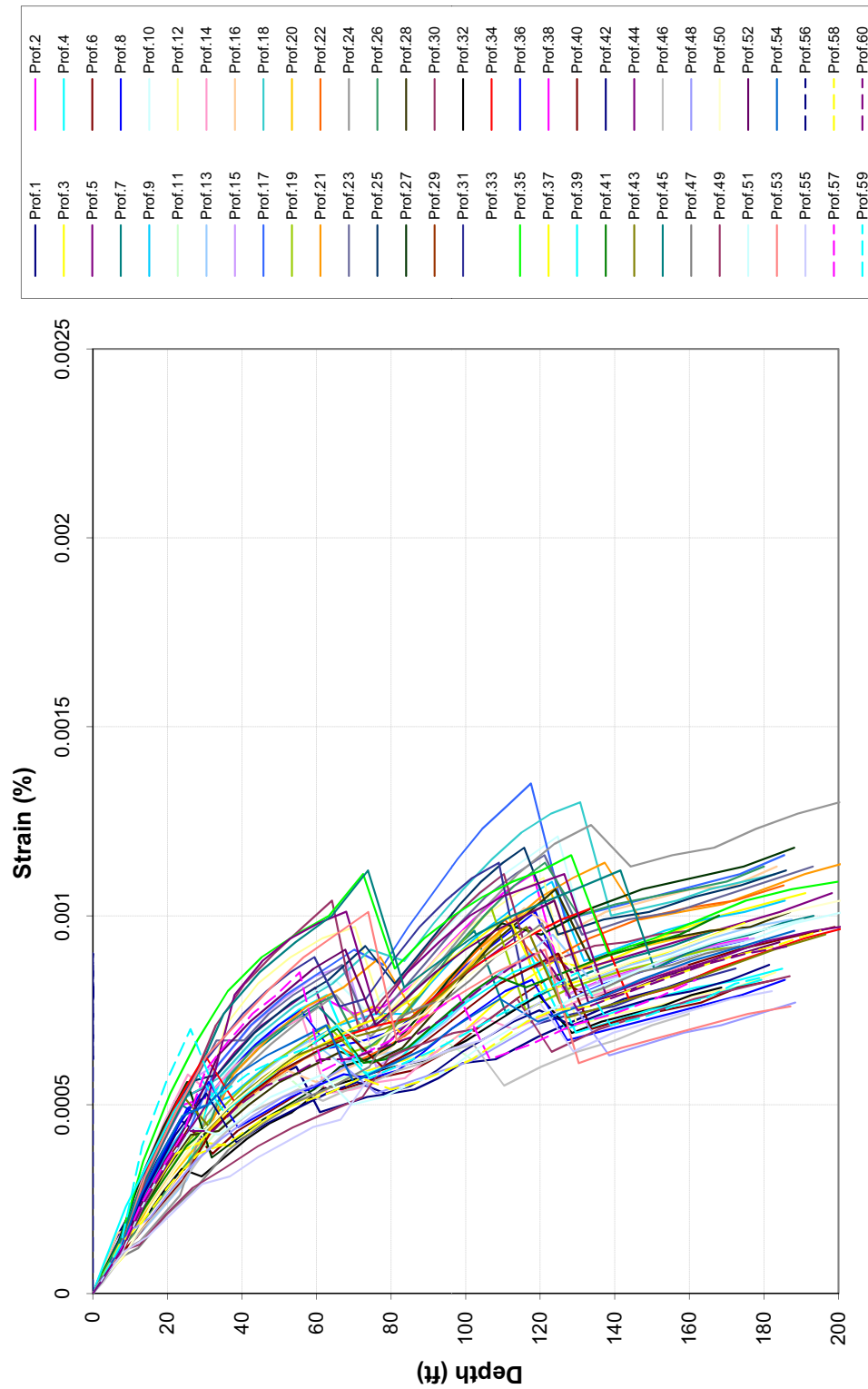


Figure 2.5-64 {HF and LF Site Spectra, and Envelopes for 10^{-4} and 10^{-5} }

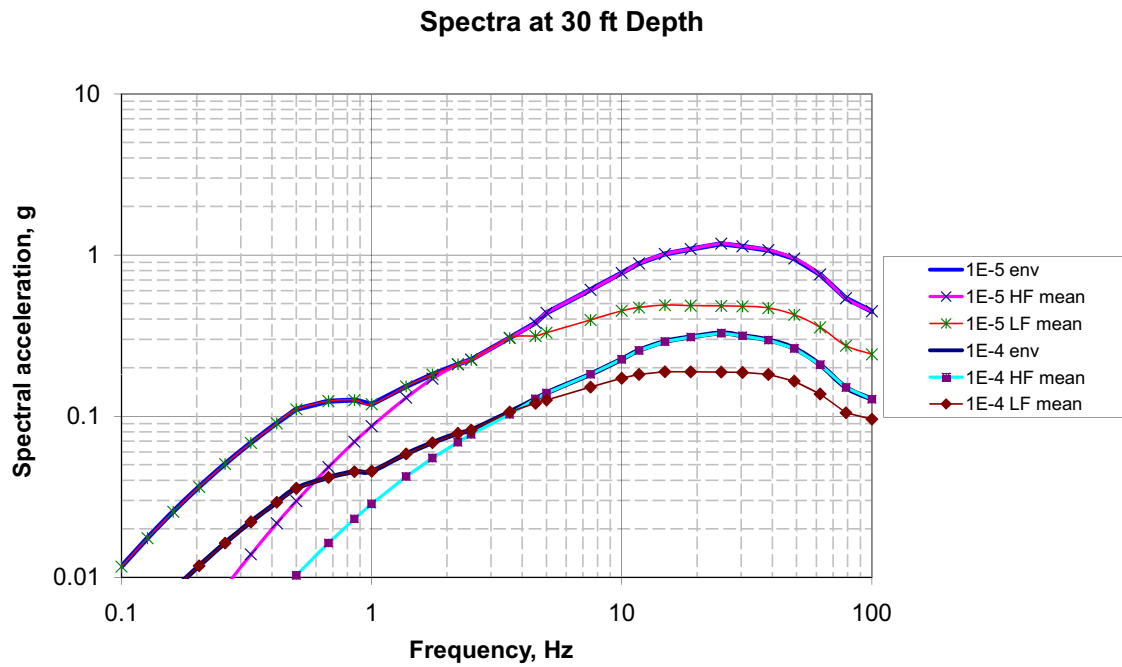


Figure 2.5-65 {Recommended Horizontal and Vertical SSE Spectra}

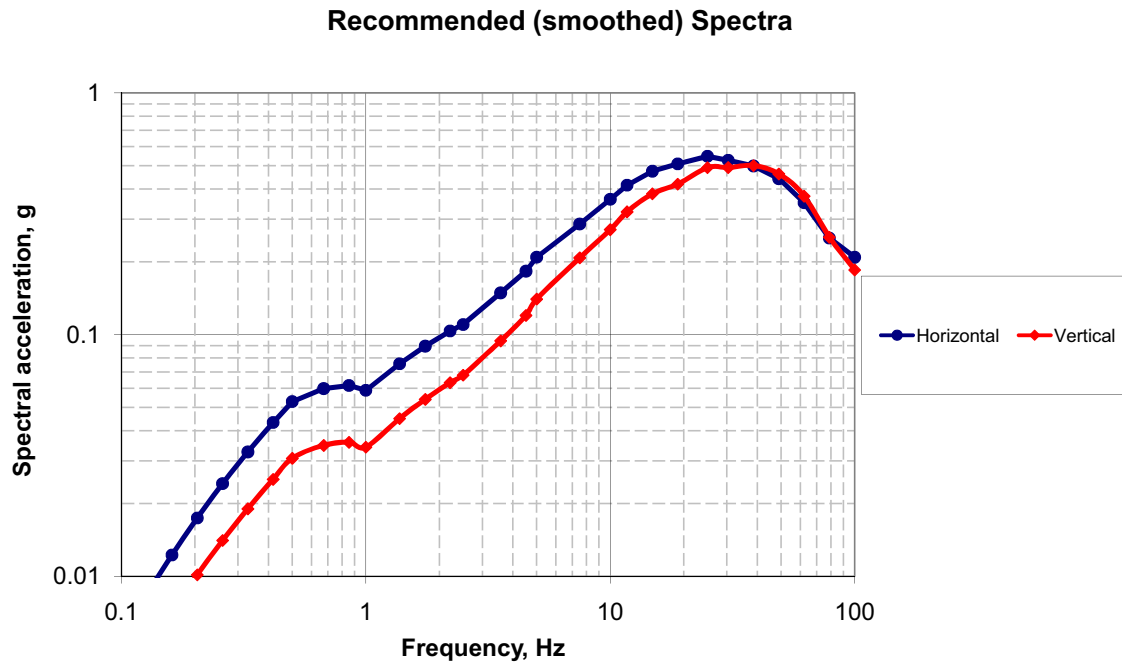


Figure 2.5-66 {V/H Ratios from Several Publications and Recommended V/H Ratios}

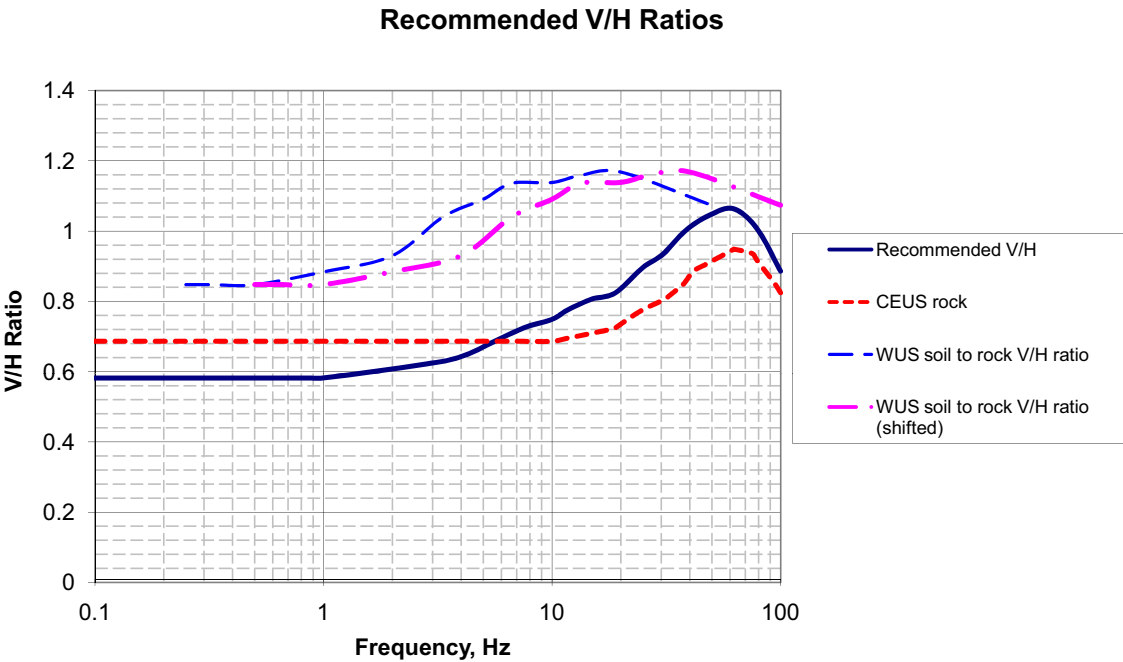


Figure 2.5-67 {Mean and Fractile Rock Hazard Curves for PGA}

PGA Hazard Curves

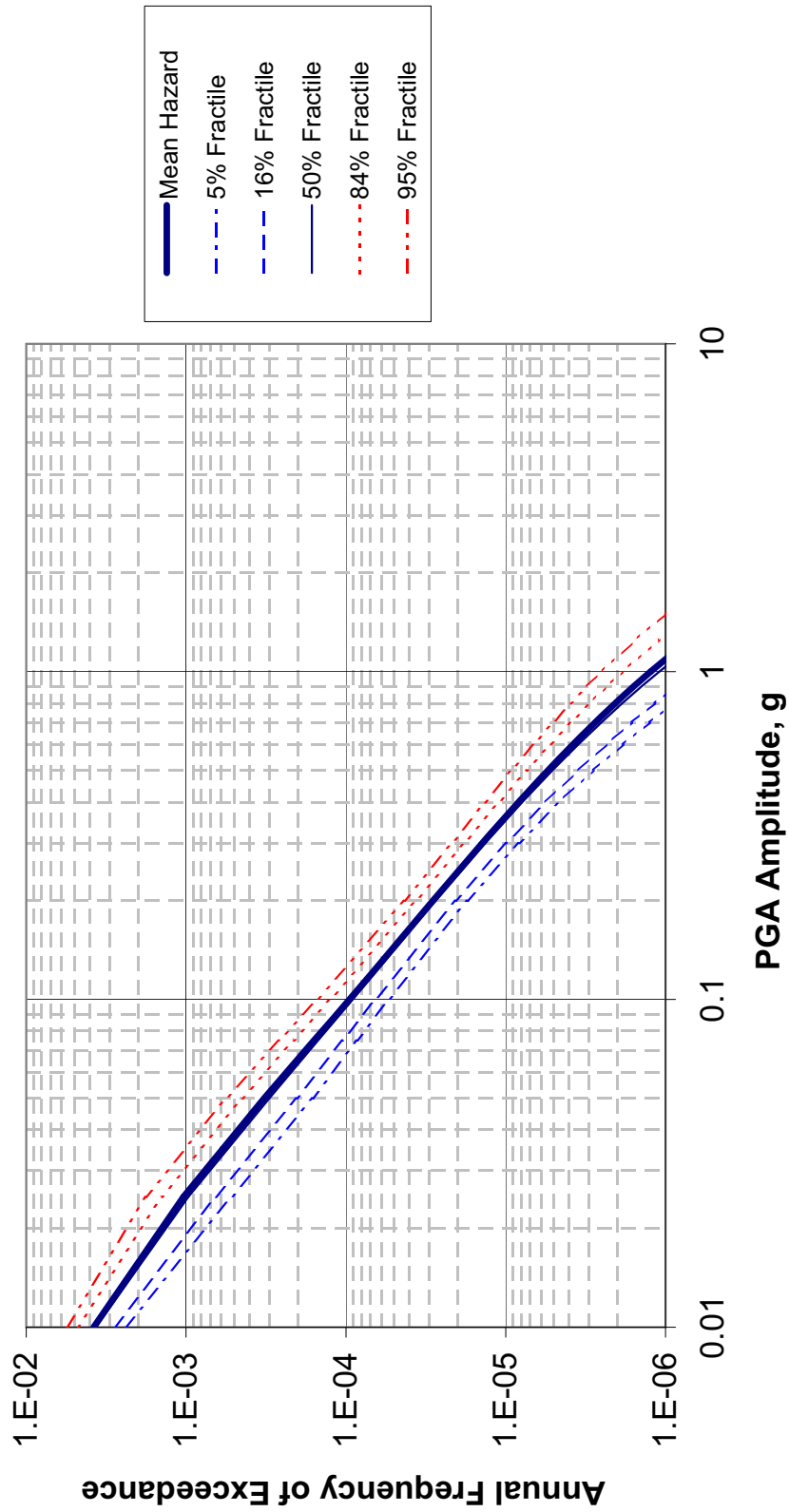


Figure 2.5-68 {Mean and Fractile Rock Hazard Curves for 25 Hz}

25 Hz Hazard Curves

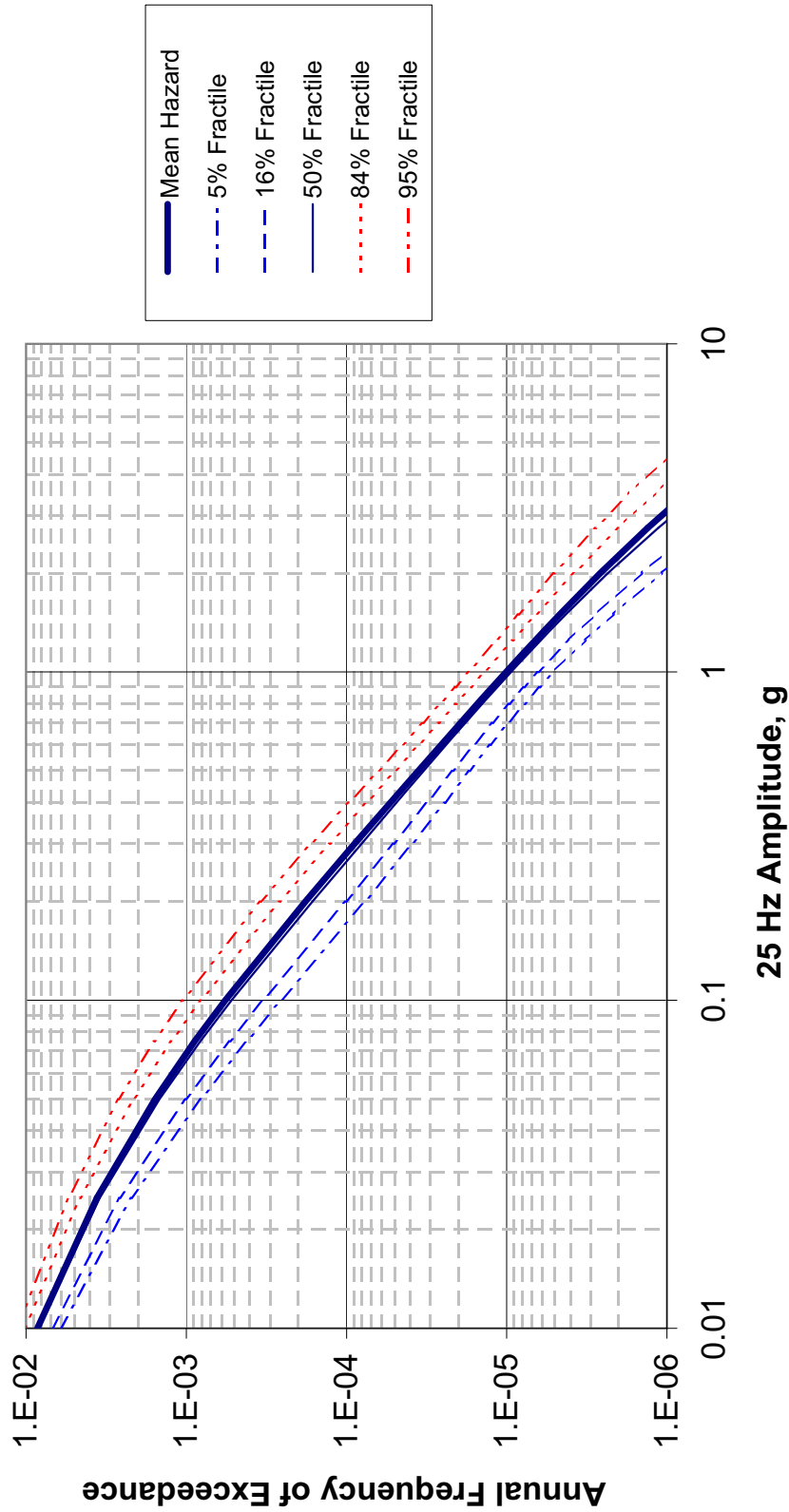


Figure 2.5-69 {Mean and Fractile Rock Hazard Curves for 10 Hz}

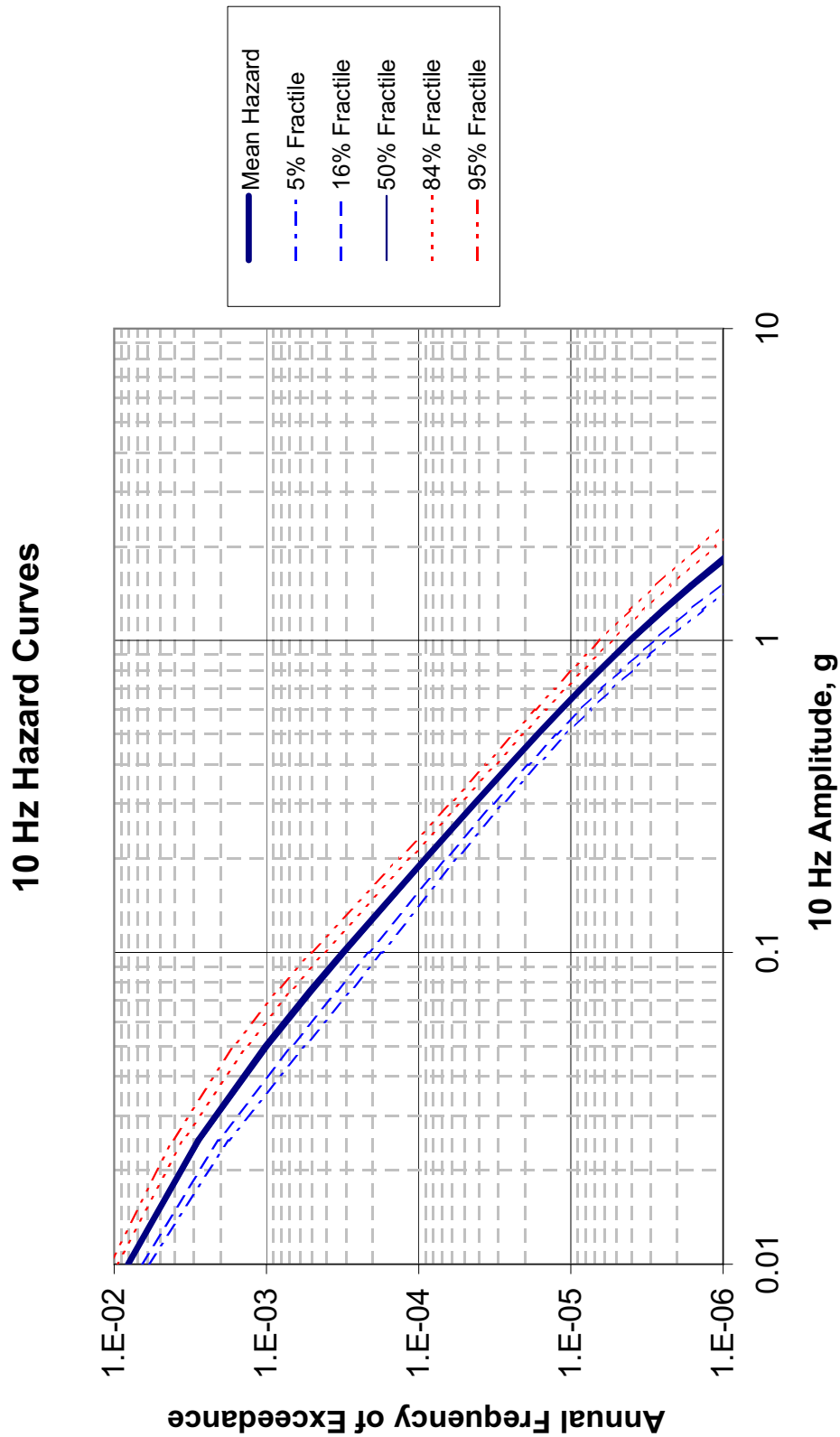


Figure 2.5-70 {Mean and Fractile Rock Hazard Curves for 5.0 Hz}

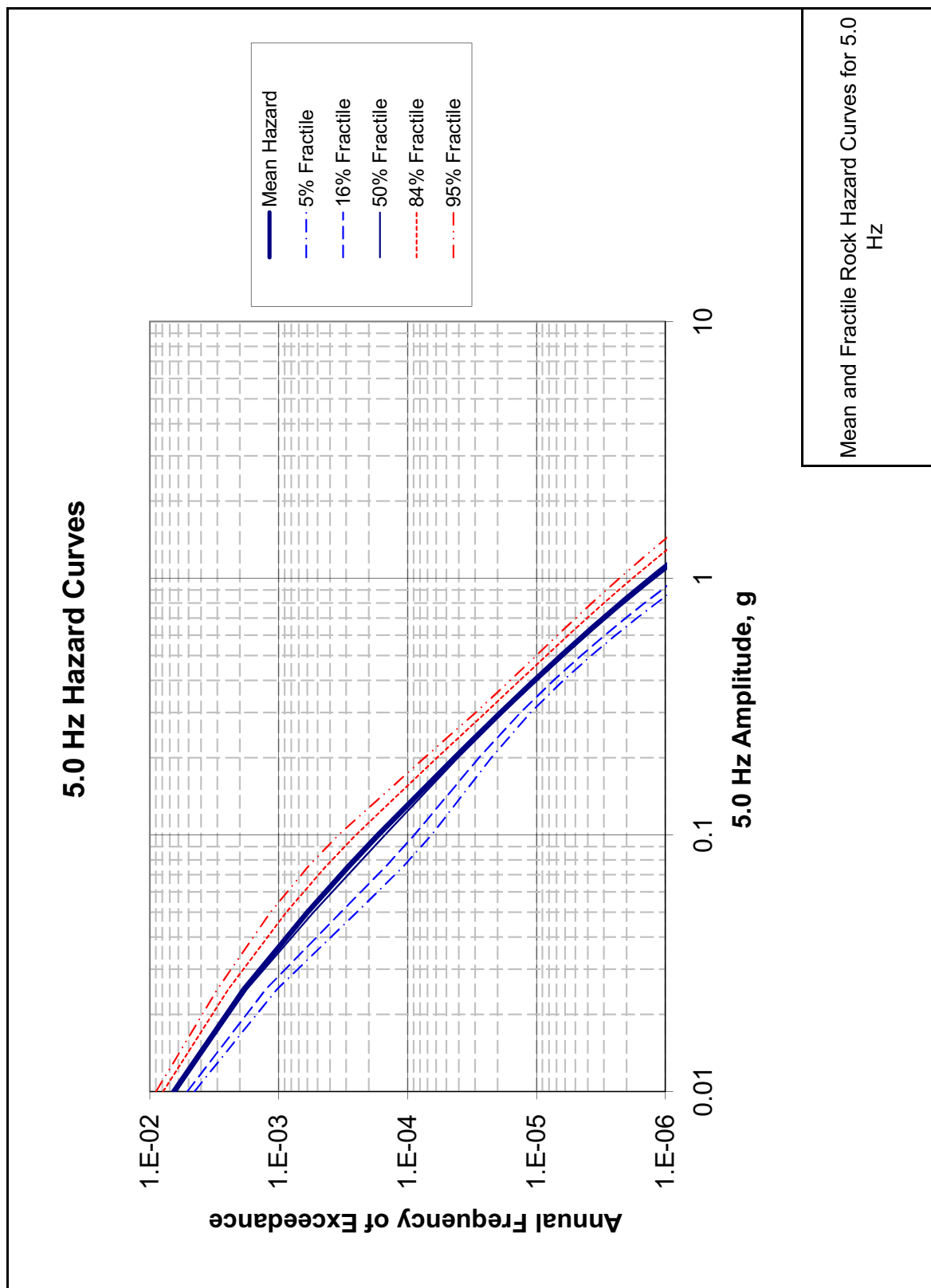


Figure 2.5-71 {Mean and Fractile Rock Hazard Curves for 2.5 Hz}

2.5 Hz Hazard Curves

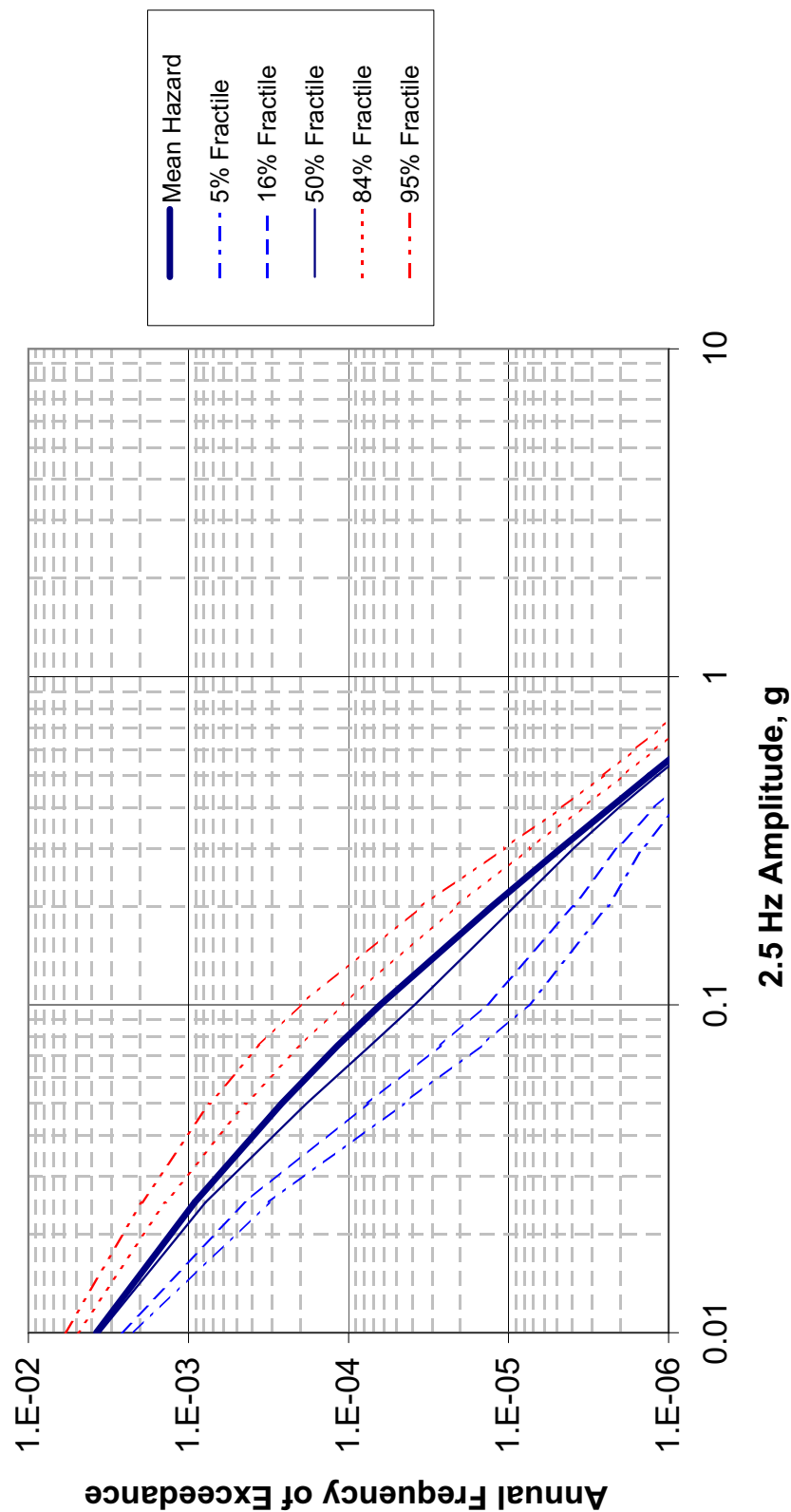


Figure 2.5-72 {Mean and Fractile Rock Hazard Curves for 1.0 Hz}

1.0 Hz Hazard Curves

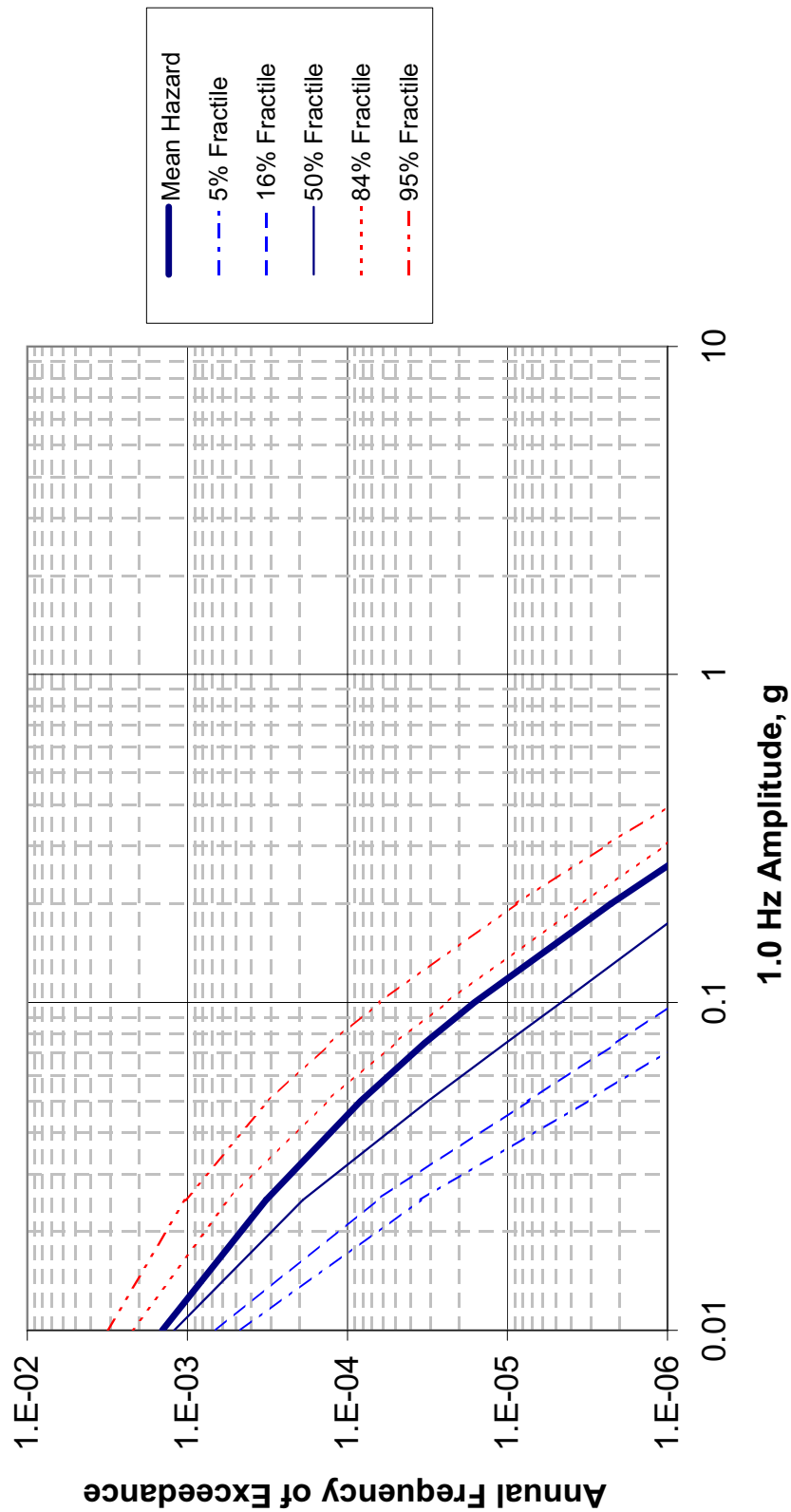


Figure 2.5-73 {Mean and Fractile Rock Hazard Curves for 0.5 Hz}

0.5 Hz Hazard Curves

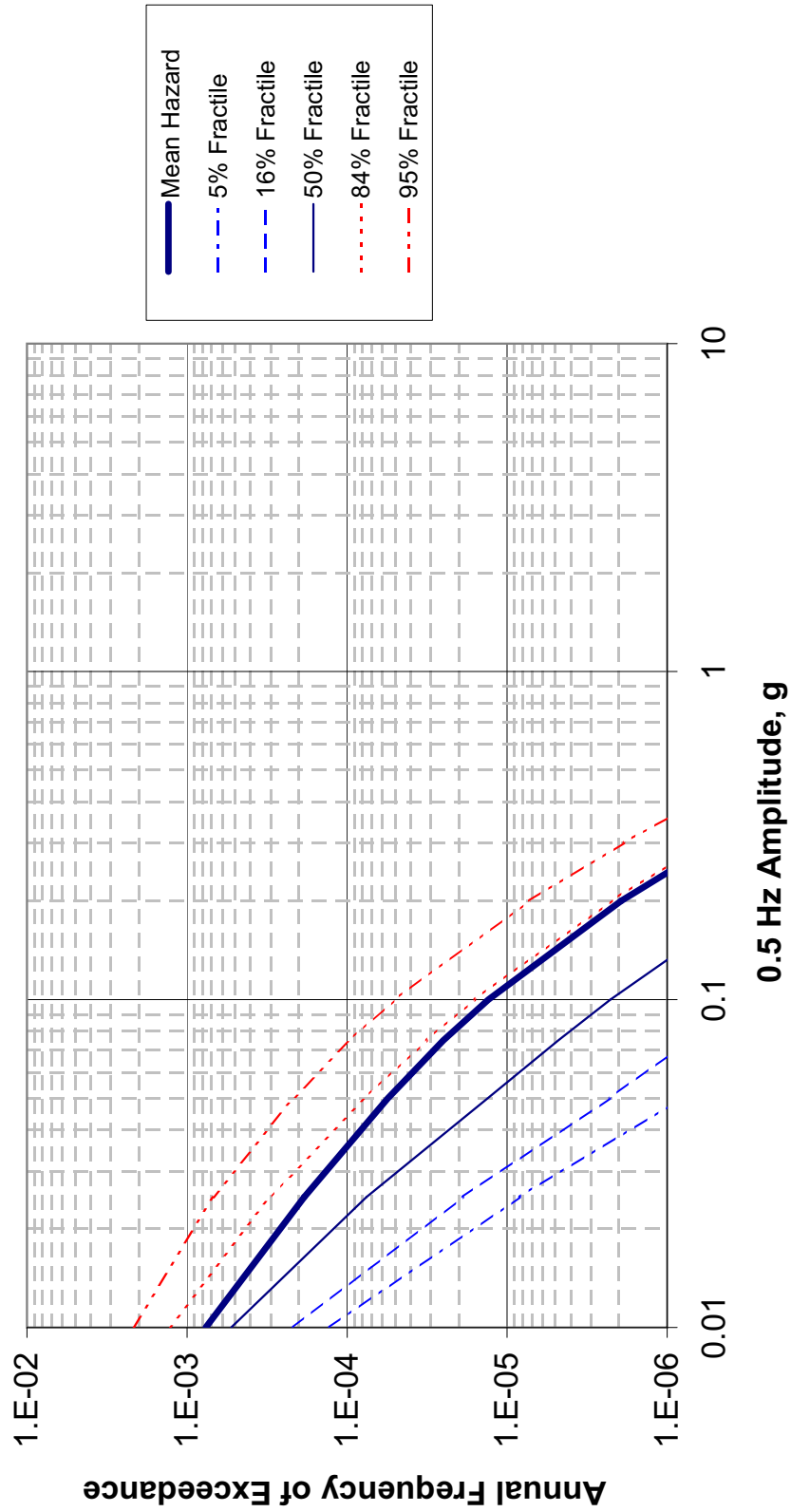


Figure 2.5-74 {Location of the Arms of the New Madrid Fault System}

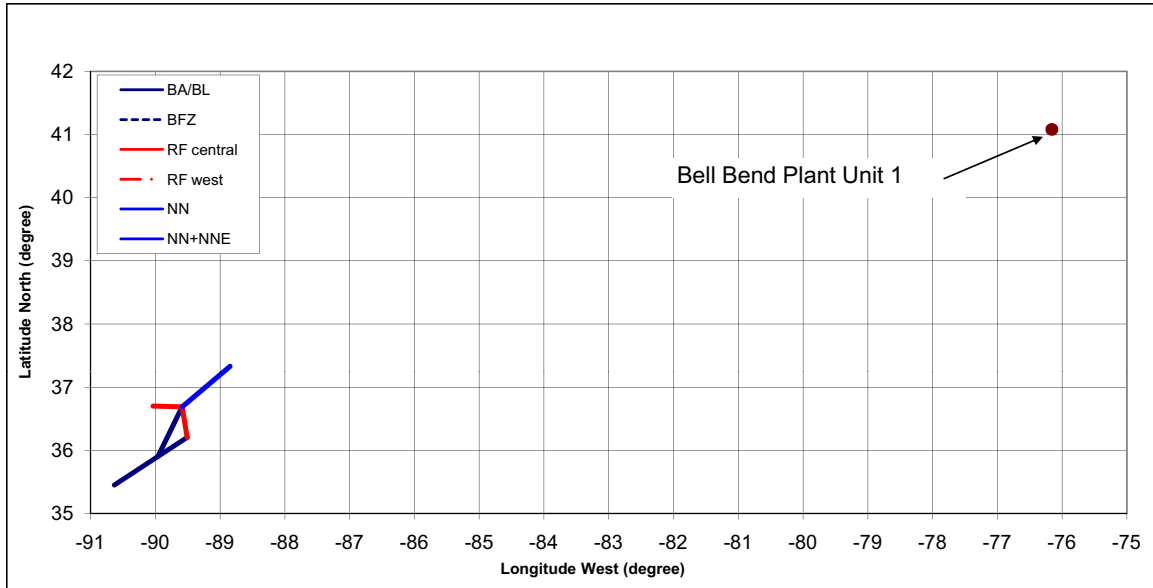
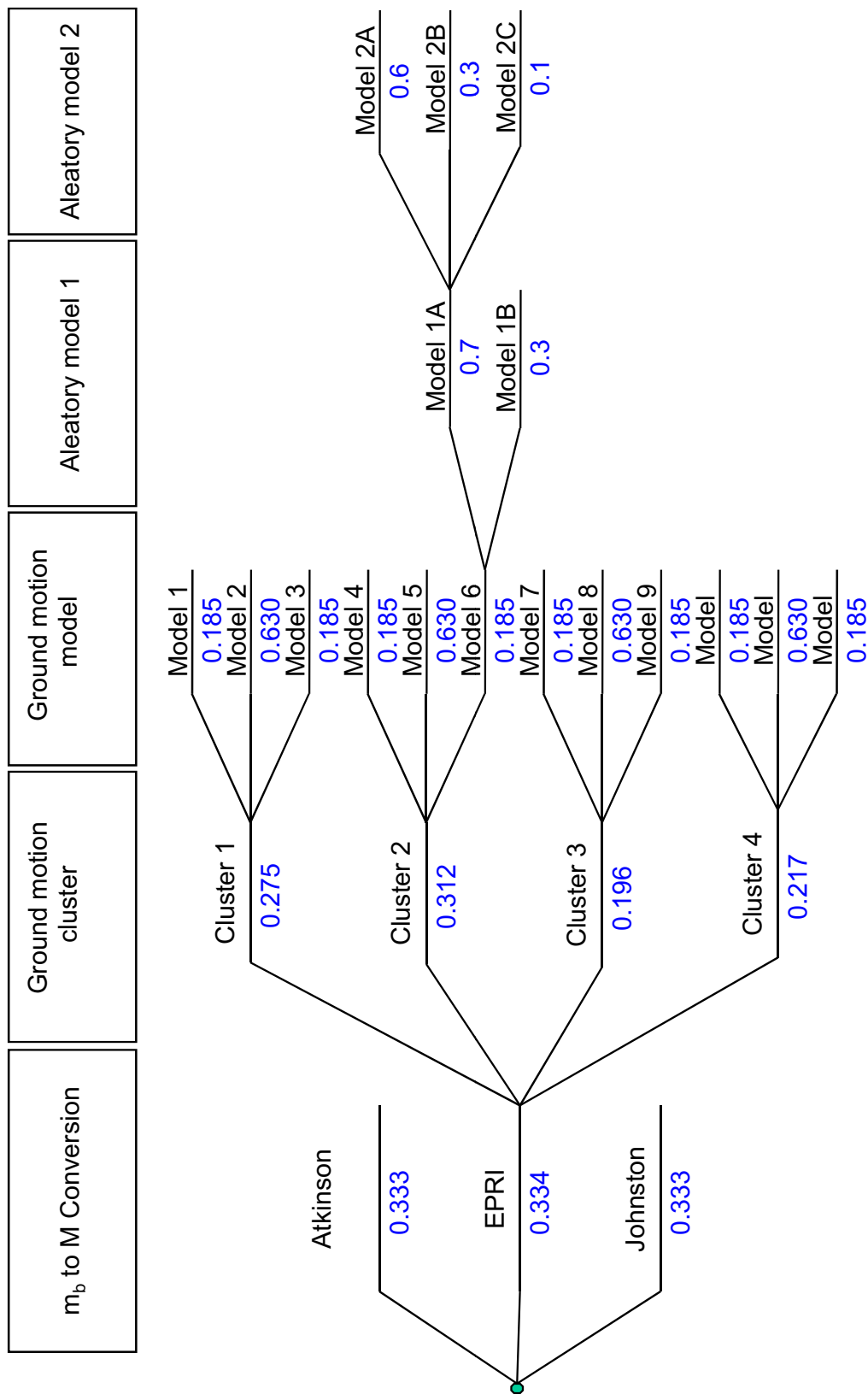


Figure 2.5-75 {Logic Tree of Ground Motion Models for Non-General Sources}



Note: Non-rift cluster 4 for Wabash Valley and Rift cluster 4 for New Madrid

Figure 2.5-76 {Logic Tree of Ground Motion Models for General Area Sources}

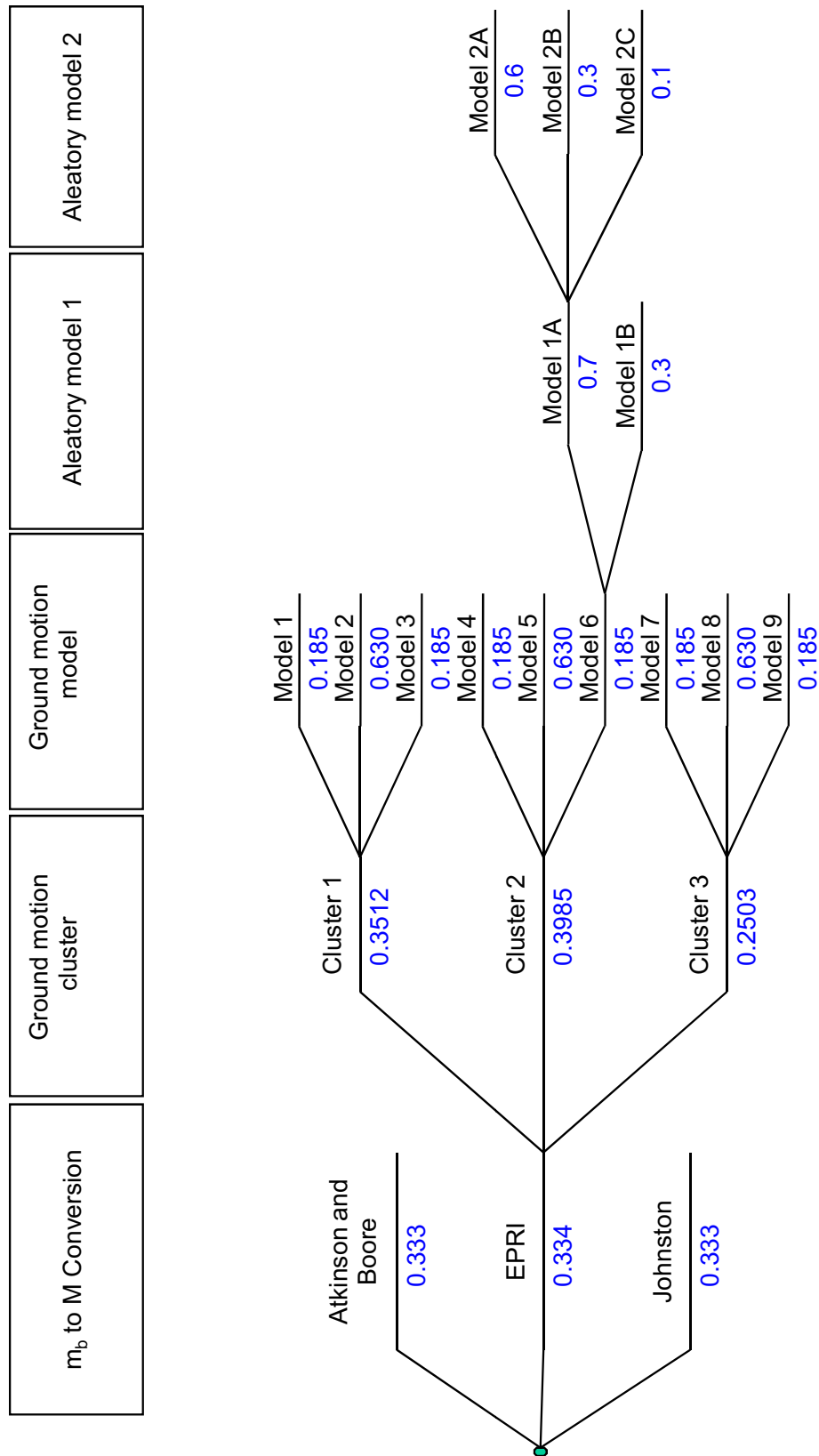


Figure 2.5-77 { 10^{-4} Response Spectra of Controlling Events at BBNPP}

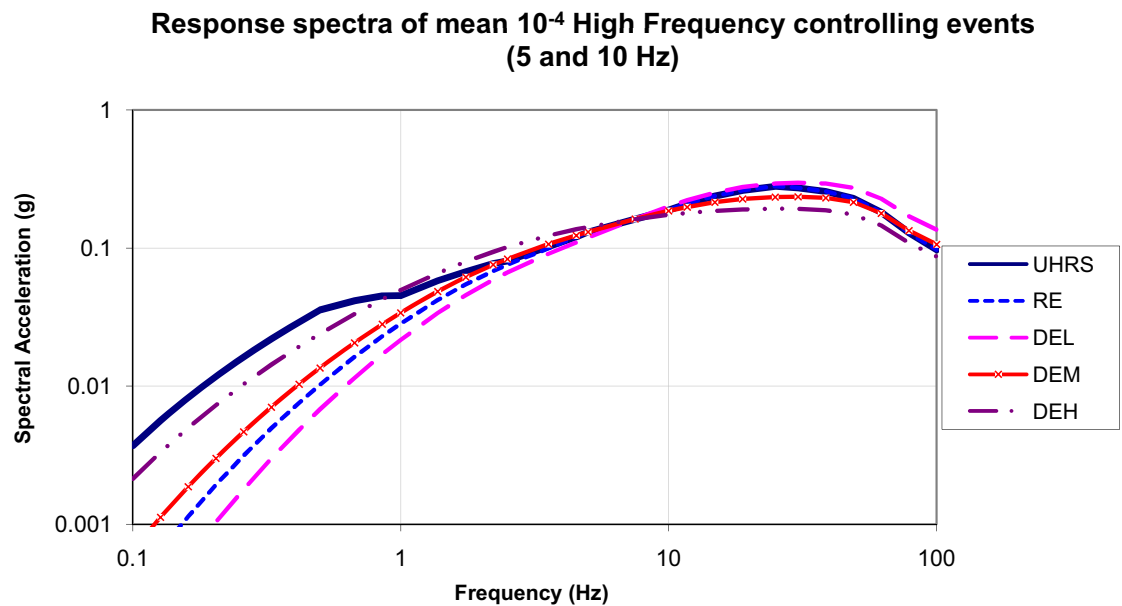
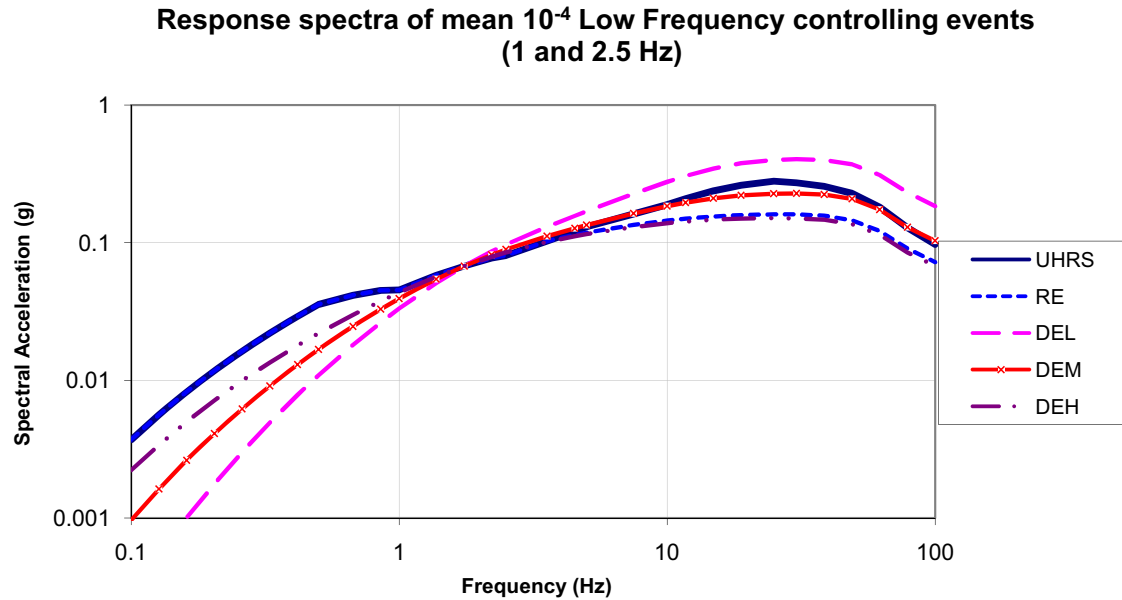


Figure 2.5-78 { 10^{-5} Response Spectra of Controlling Events at BBNPP}

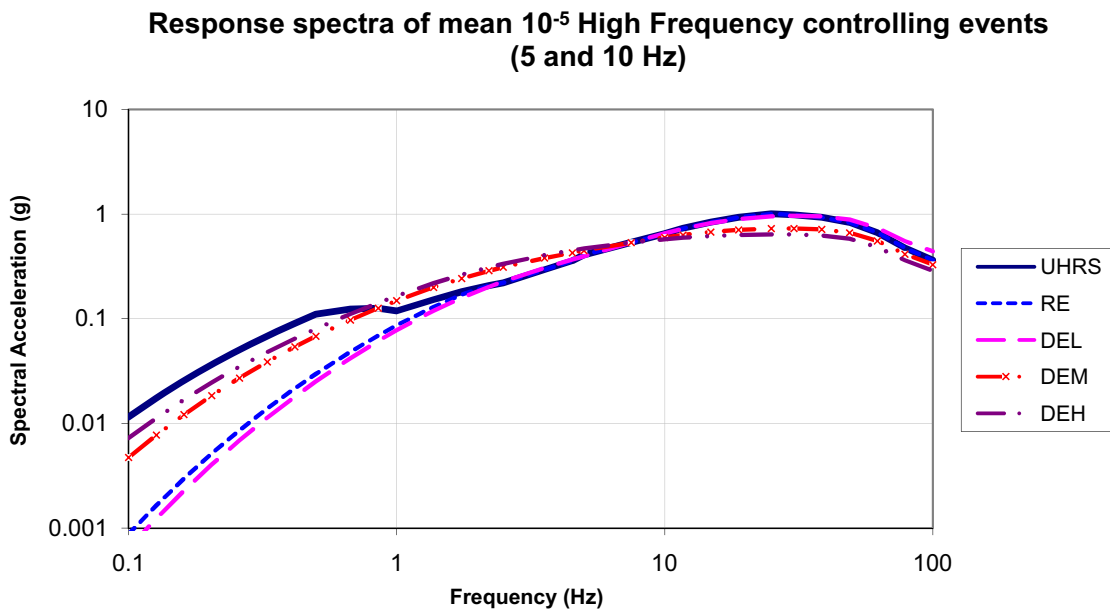
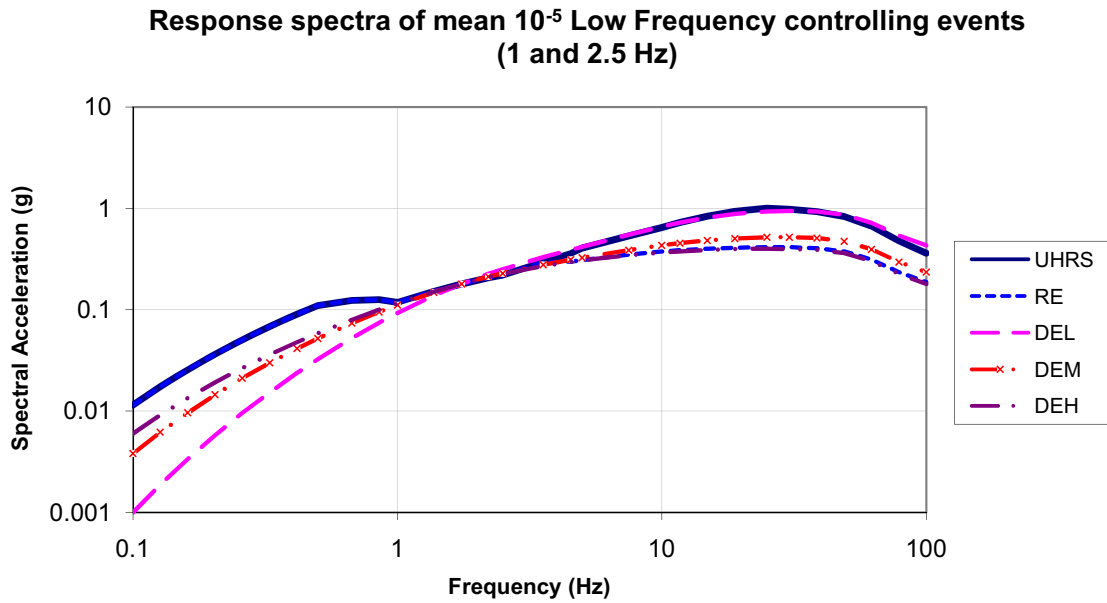


Figure 2.5-79 {Response Spectra of Selected Time Histories for 10^{-4} Controlling Events LF, DEL and DEH after Spectral Matching}

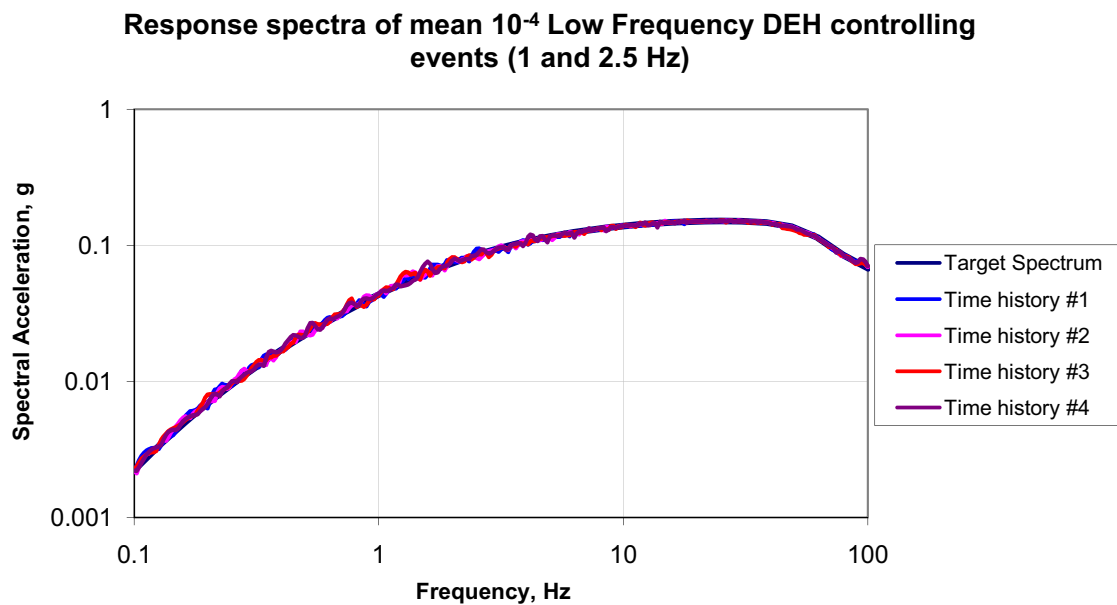
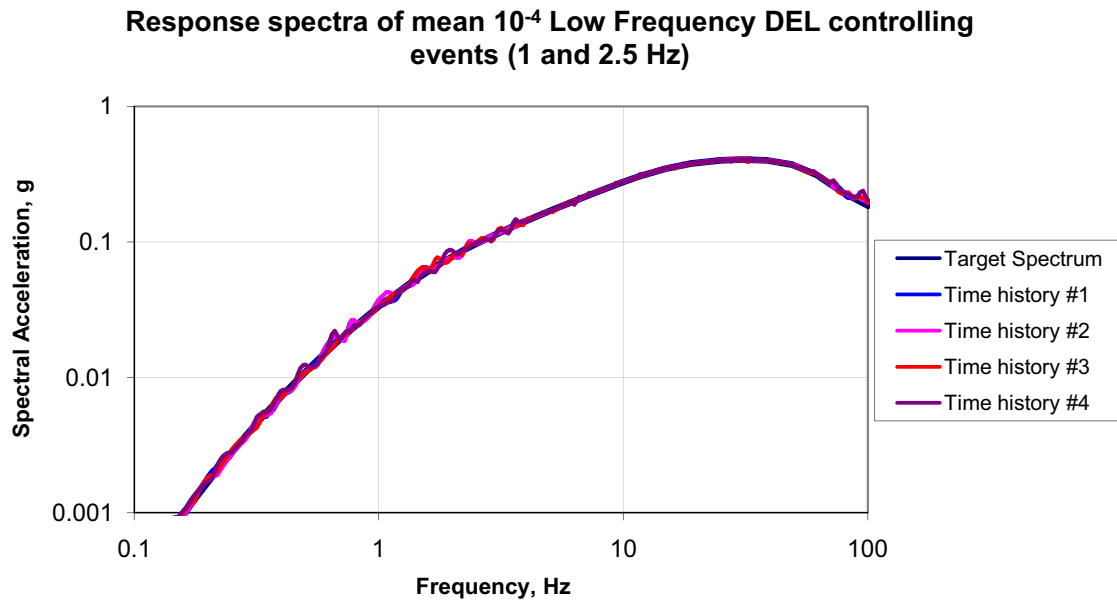


Figure 2.5-80 { 10^{-4} Smooth Hard Rock Reference Spectra}

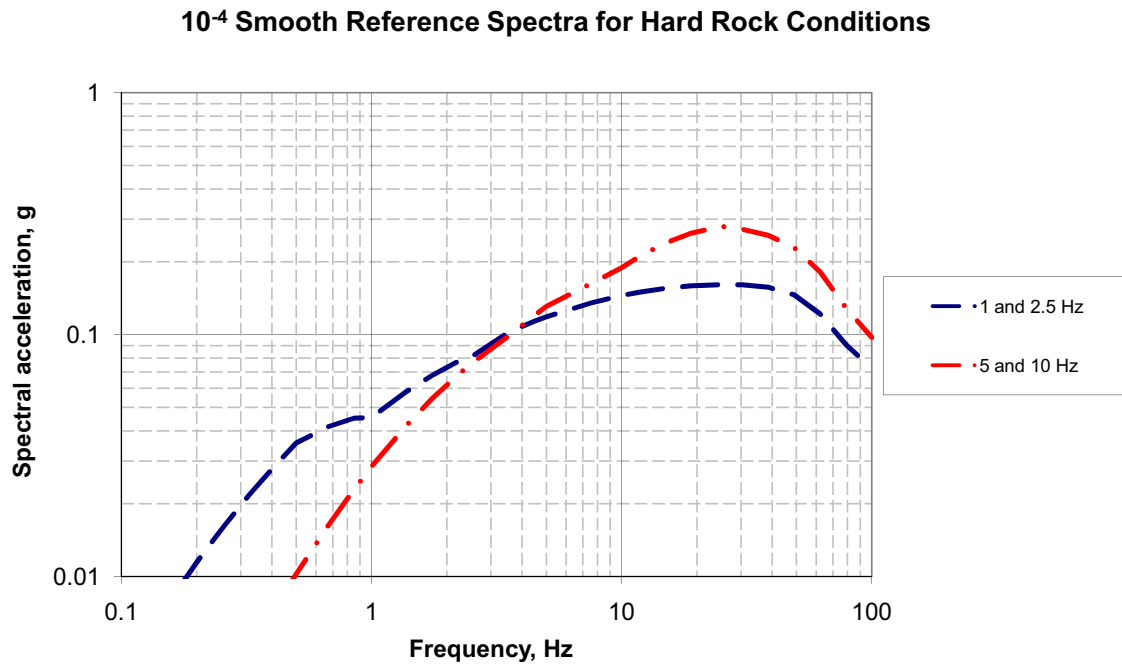


Figure 2.5-81 {10⁻⁵ Smooth Hard Rock Reference Spectra}

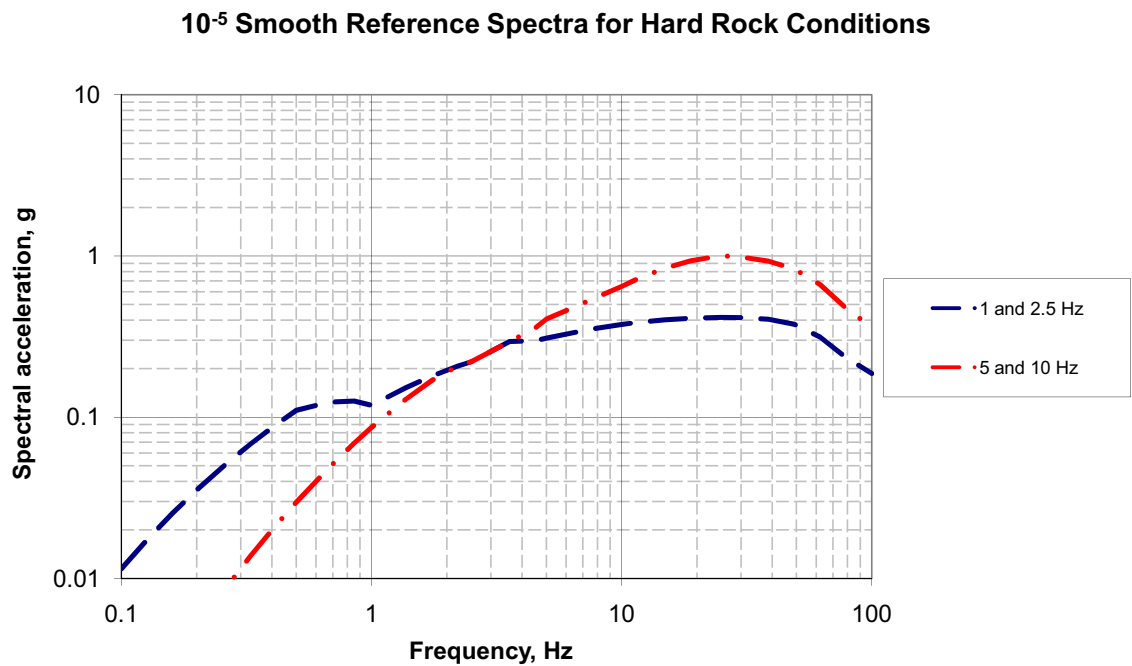


Figure 2.5-82 {UCSS Map}

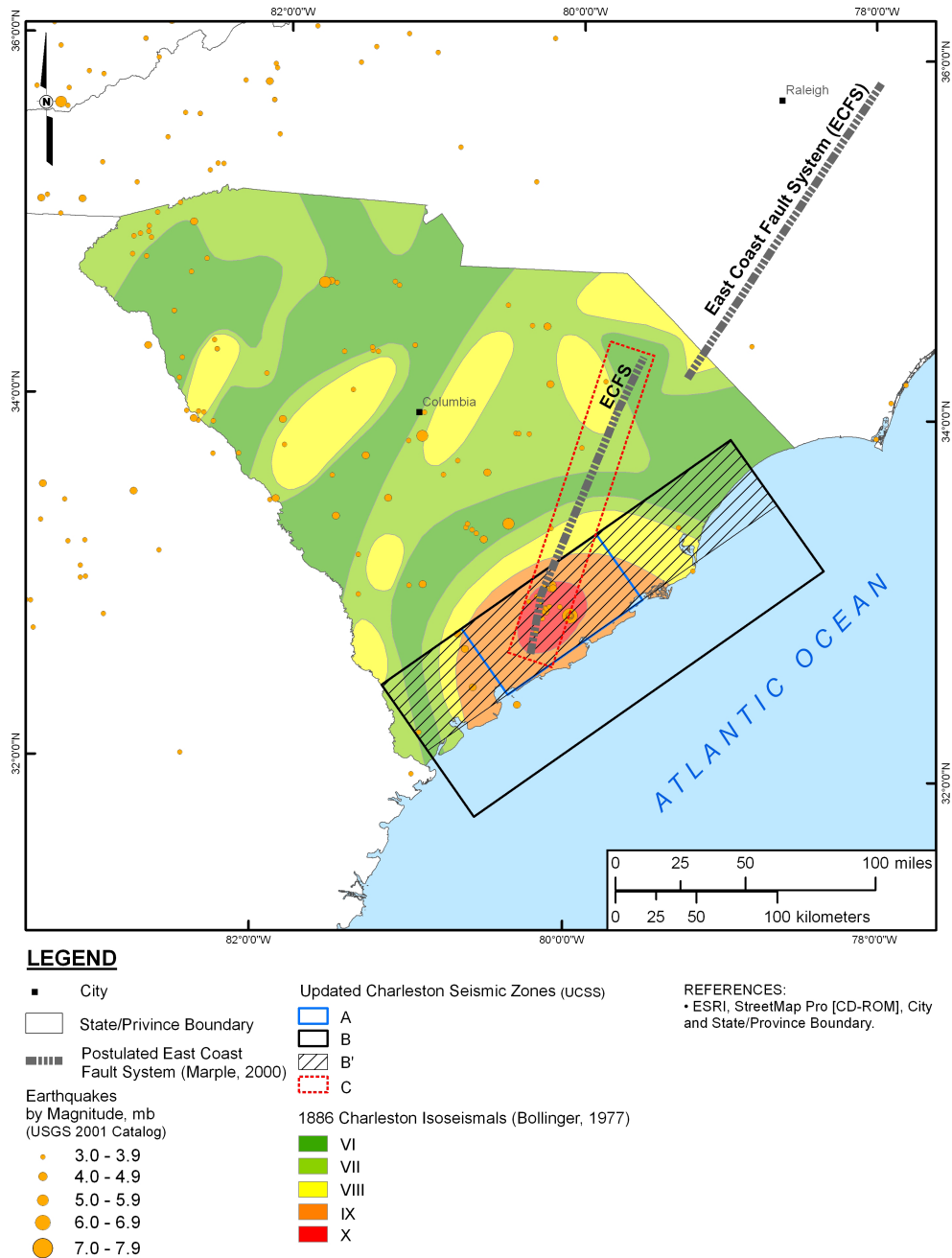


Figure 2.5-83 {Updated Charleston Seismic Sources (UCSS) Logic Tree}

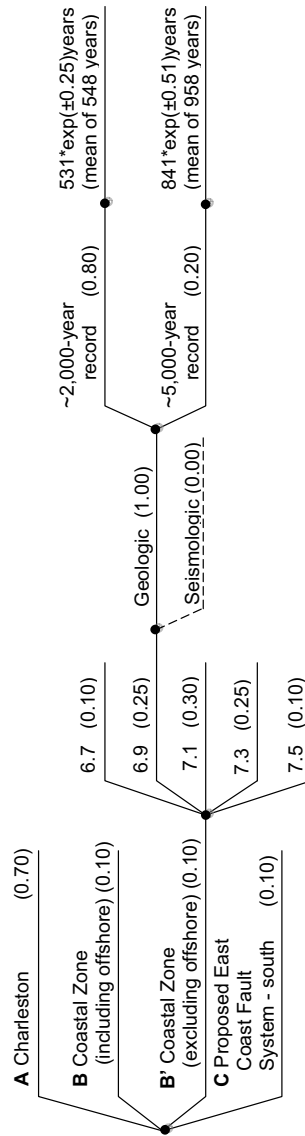


Figure 2.5-84 {Comparison Vs Profiles Between 10 Generic S I Profiles and Average BBNPP Profile}

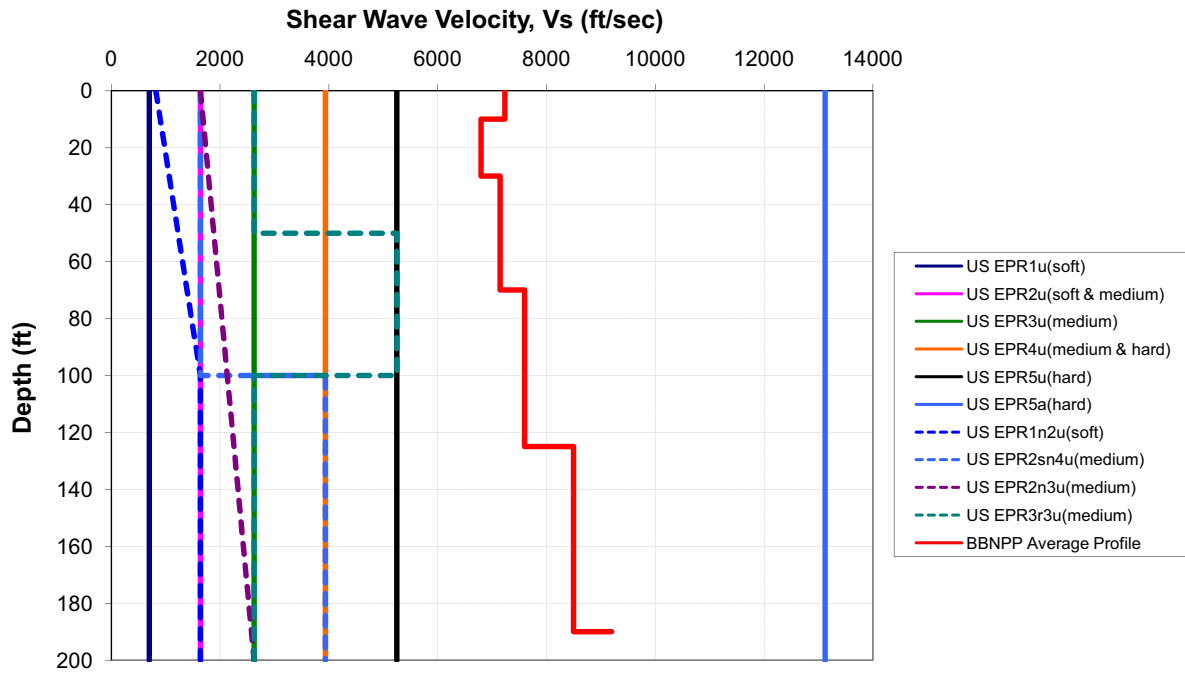
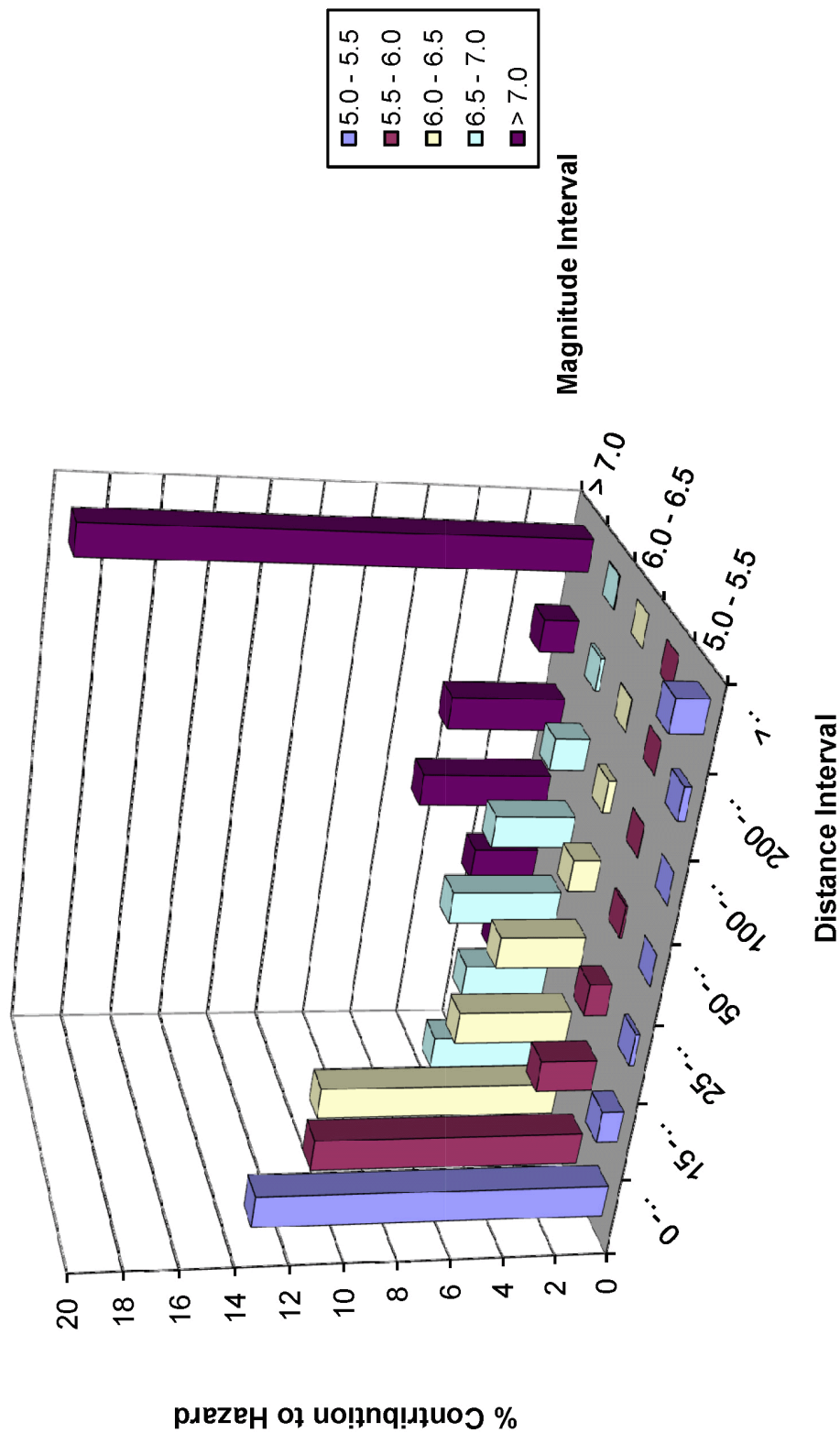
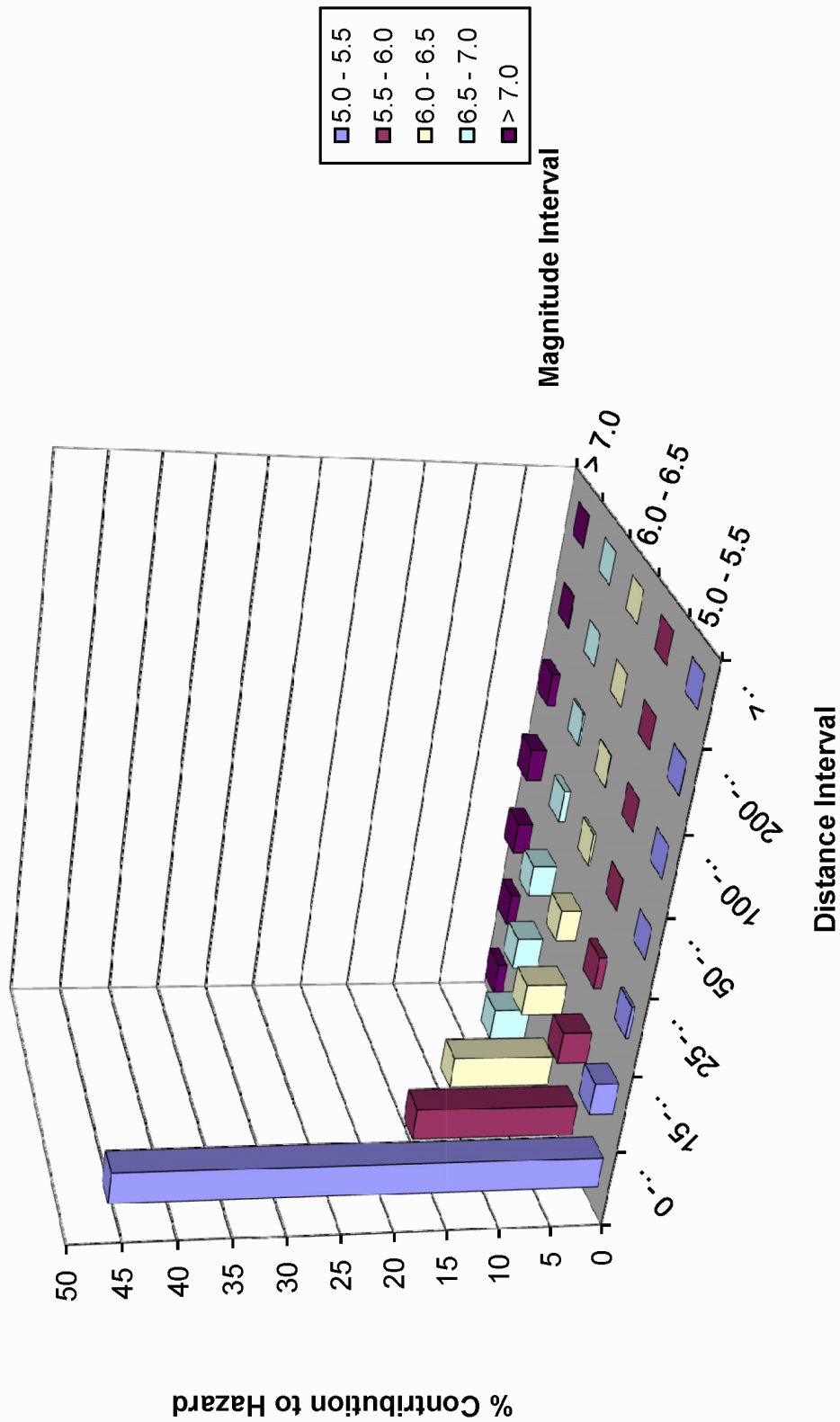


Figure 2.5-85 {Mean 10^{-6} Rock Deaggregation for 1 and 2.5 Hz}



Hazard from events farther than 300 km (187.5 mi) is plotted in the > 300 km (187.5 mi) bins. These contributions are from the New Madrid Characteristic Earthquake.

Figure 2.5-86 {Mean 10^{-6} Rock Deaggregation for 5 and 10 Hz}



Hazard from events farther than 300 km (187.5 mi) is plotted in the > 300 km (187.5 mi) bins. These contributions are from the New Madrid Characteristic Earthquake.

Figure 2.5-87 {Earthquake Epicenters In and Near Pennsylvania}

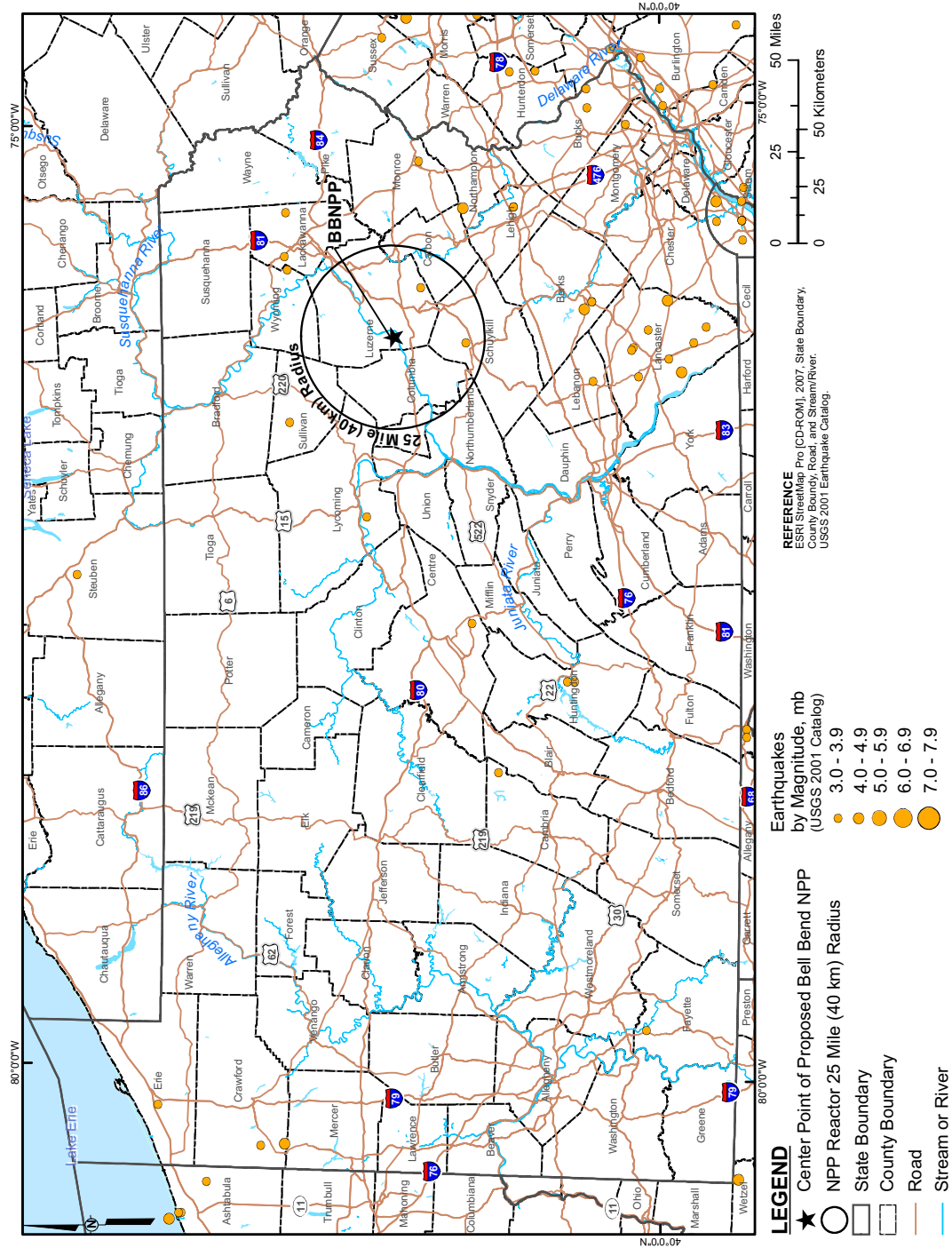


Figure 2.5-88 {Bedrock Geologic Map Pennsylvania}

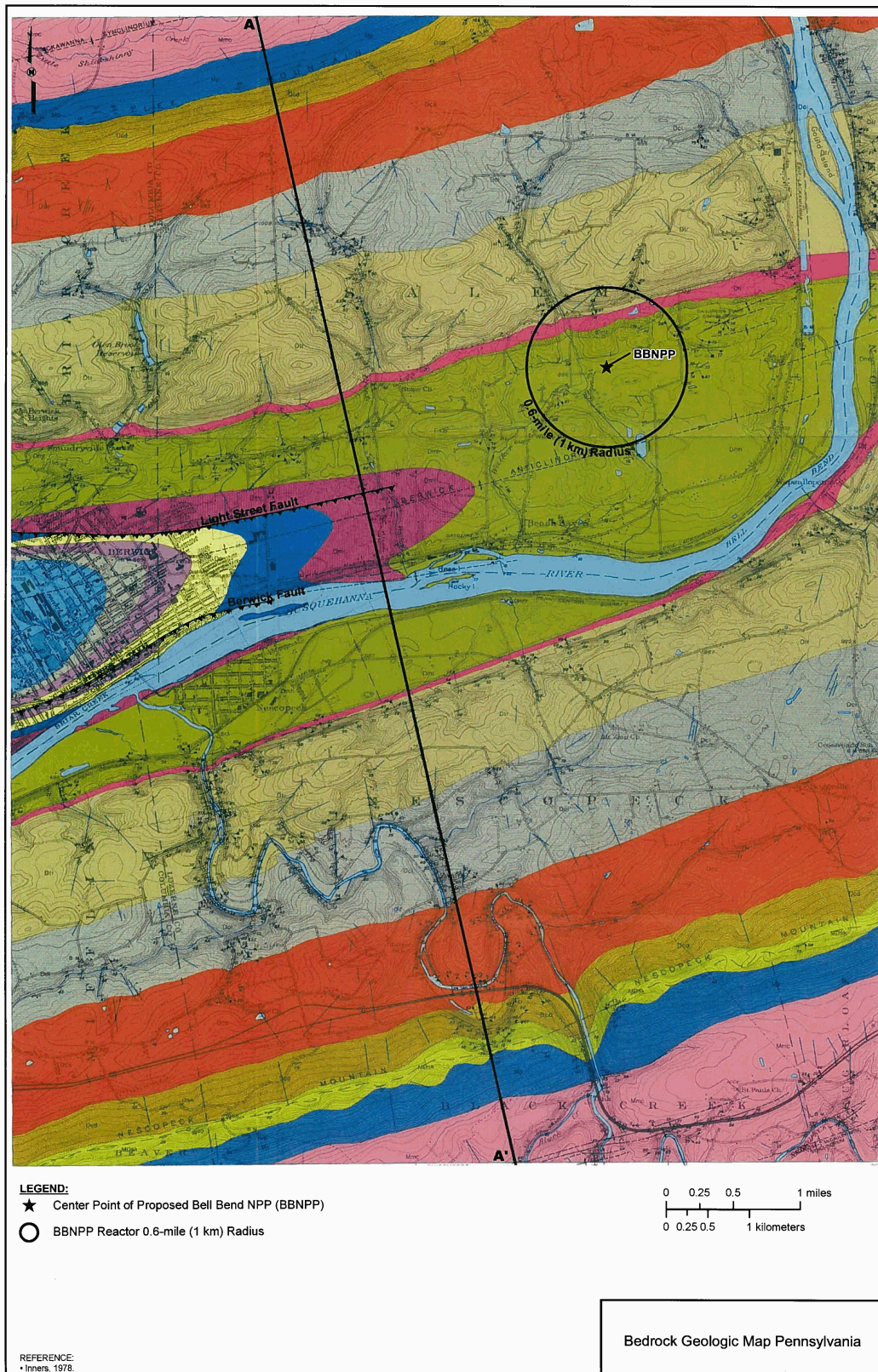


Figure 2.5-89 {Correlation Chart of Appalachian Basin}

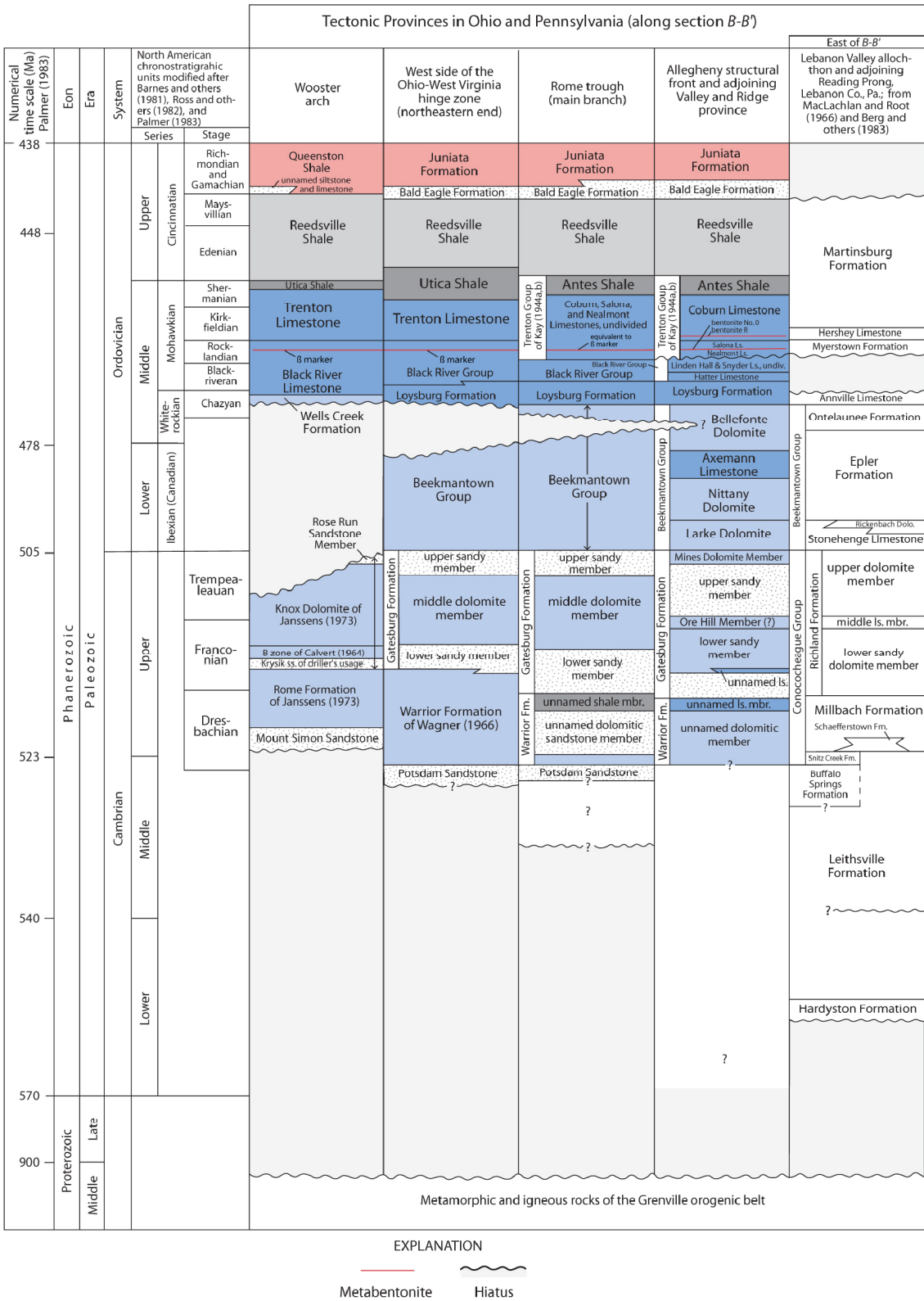
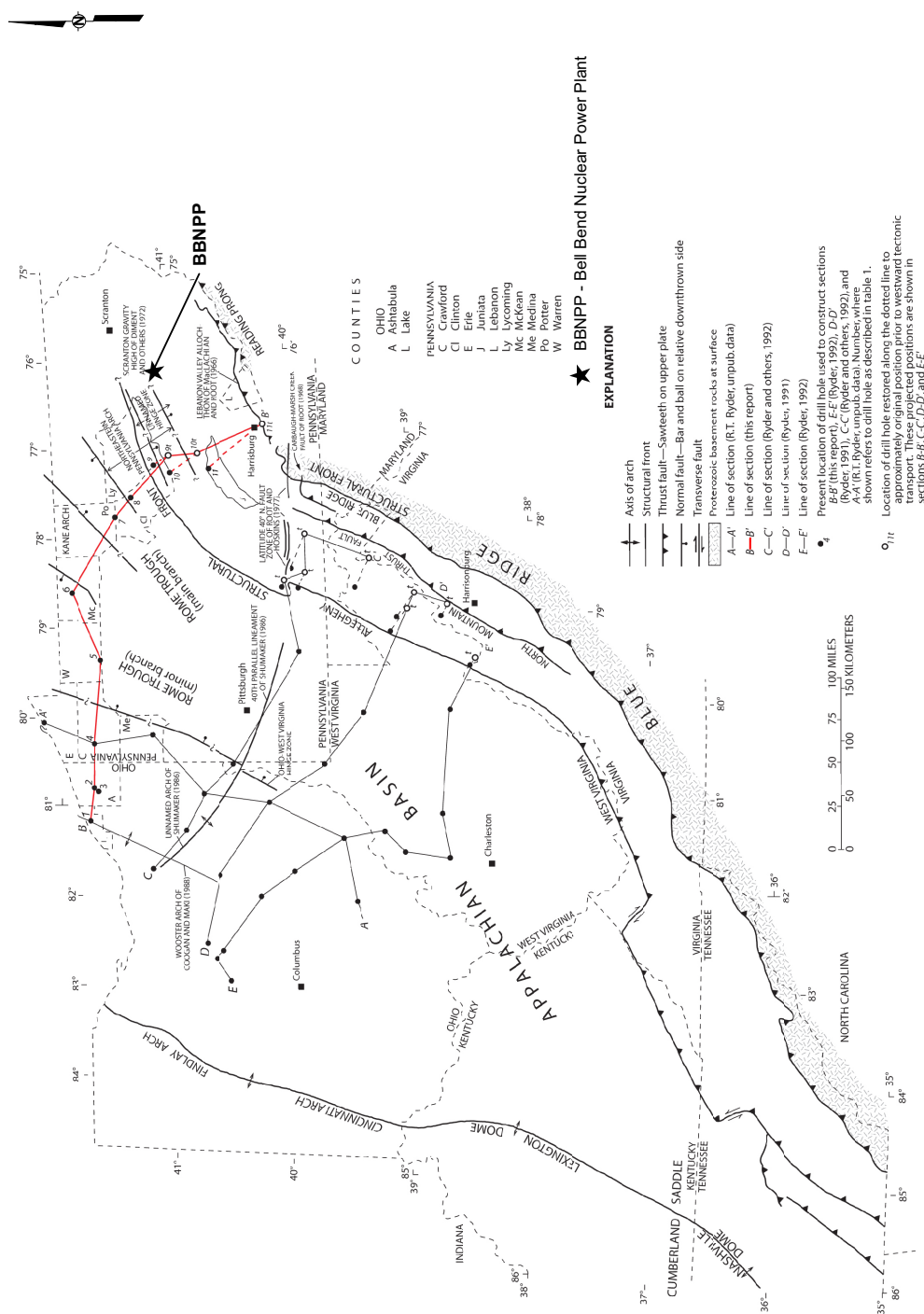


Figure 2.5-90 {Map Showing the Location of Appalachian Basin Cross Section}



NOTE: Refer to Figure 2.5.1-11a for indicated cross section.

REFERENCE:
• Crangle Jr., 2002.

Figure 2.5-91 {Cross Section Showing the Cambrian and Ordovician Rocks of the Appalachian Basin}

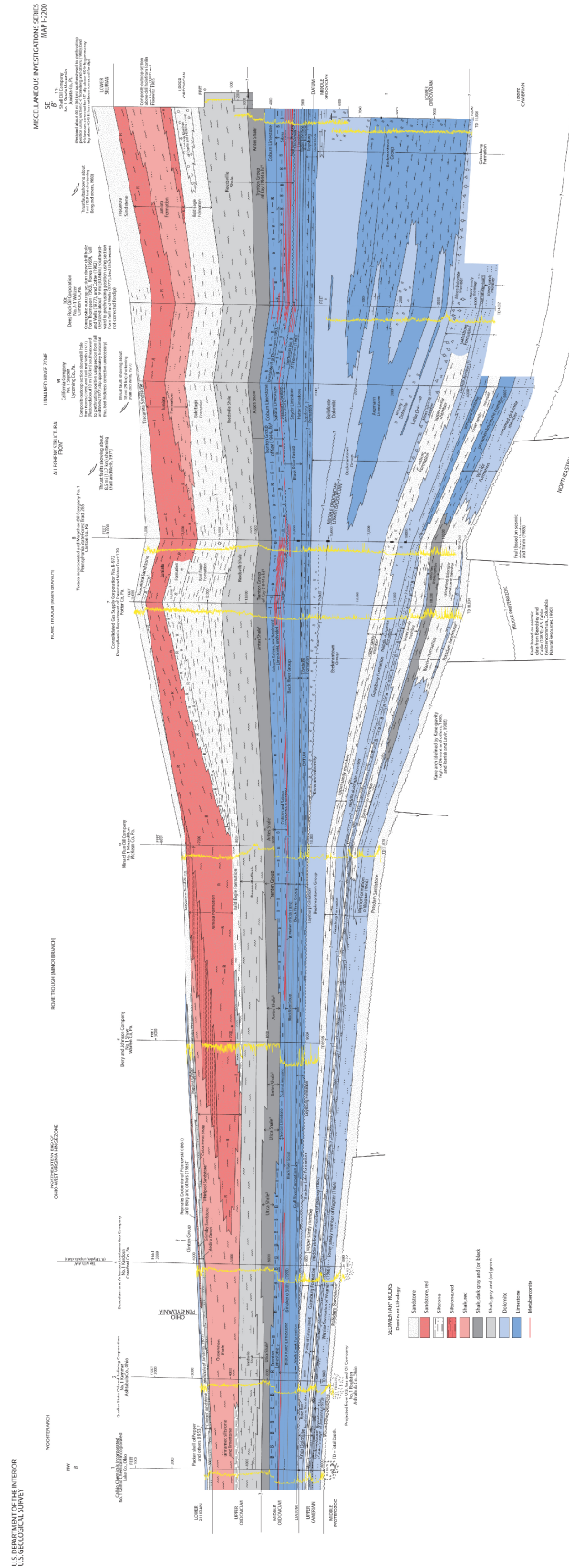


Figure 2.5-92 {Precambrian Basement Map of Appalachian Basin 25 Mile (40 km) and 5 Mile (8 km) Radii}

