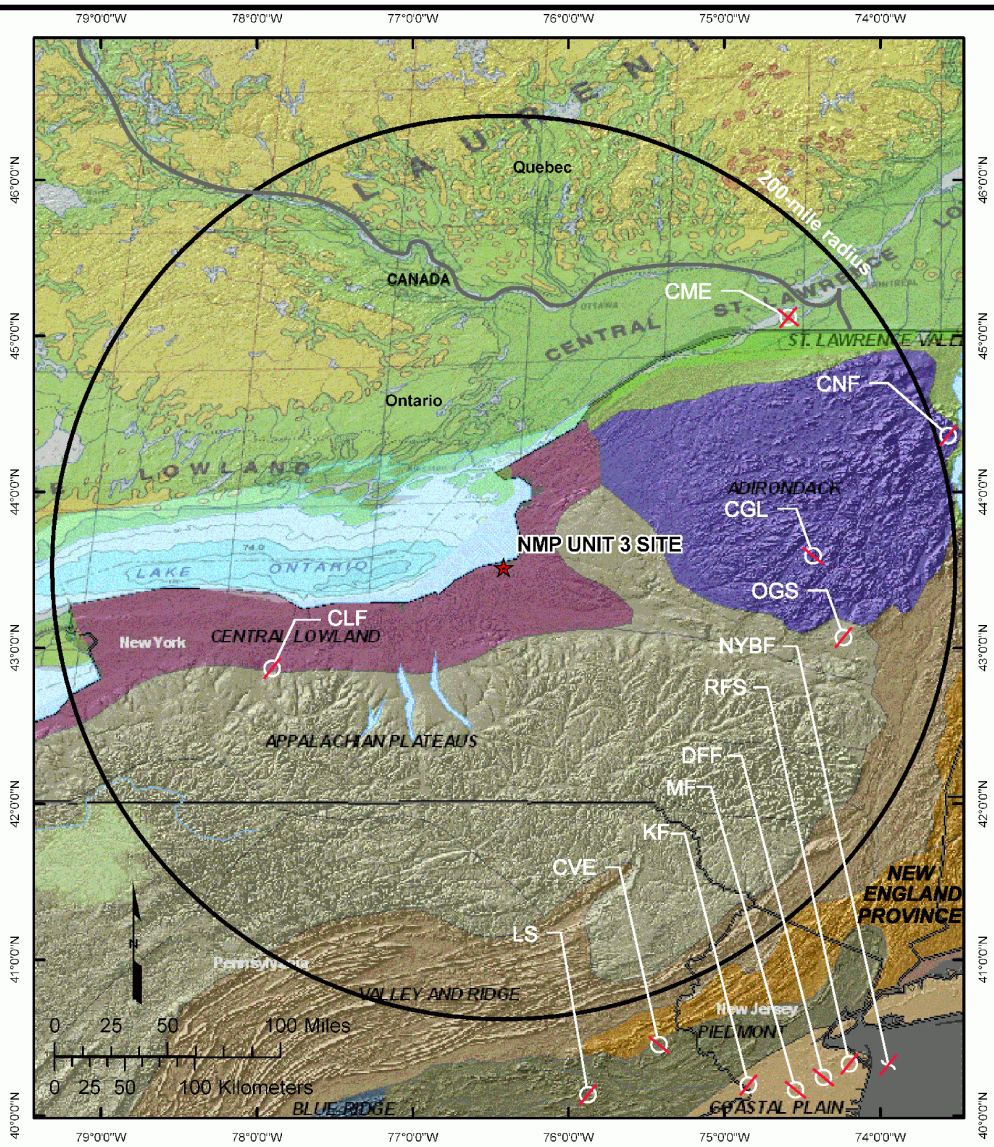
Figure 2.5-39—{Potential Quaternary Features in the Site Region}



EXPLANATION

FEATURES* COMPILED FROM CRONE AND WHEELER (2000) AND WHEELER (2006)

(1) CLARENDON-LINDEN FAULT ZONE (CLF)
(2) CORNWALL-MASSENA EARTHQUAKE (CME)
(3) CATLIN LAKE-GOODNOW POND LINEAMENT (CGL)
(4) CHAMPLAIN LOWLANDS NORMAL FAULTS (CNF)
(5) OFFSET GLACIAL SURFACES (OGS)
(6) RAMAPO FAULT SYSTEM (RFS)
(7) KINGSTON FAULT (KF)
(8) DOBBS FERRY FAULT ZONE (DFF)
(9) MOSHOLU FAULT (MF)
(10) NEW YORK BIGHT FAULT (OFFSHORE) (NYBF)
(11) CACOOSING VALLEY EARTHQUAKE (CVE)
(12) LANCASTER SEISMIC ZONE (LS)

/ = APPROXIMATE STRIKE OF POTENTIAL QUATERNARY FEATURE OR FAULT-PLANE SOLUTION

Figure 2.5-40—{Site Vicinity Topographic Map 25-Mile (40-Km) Radius}

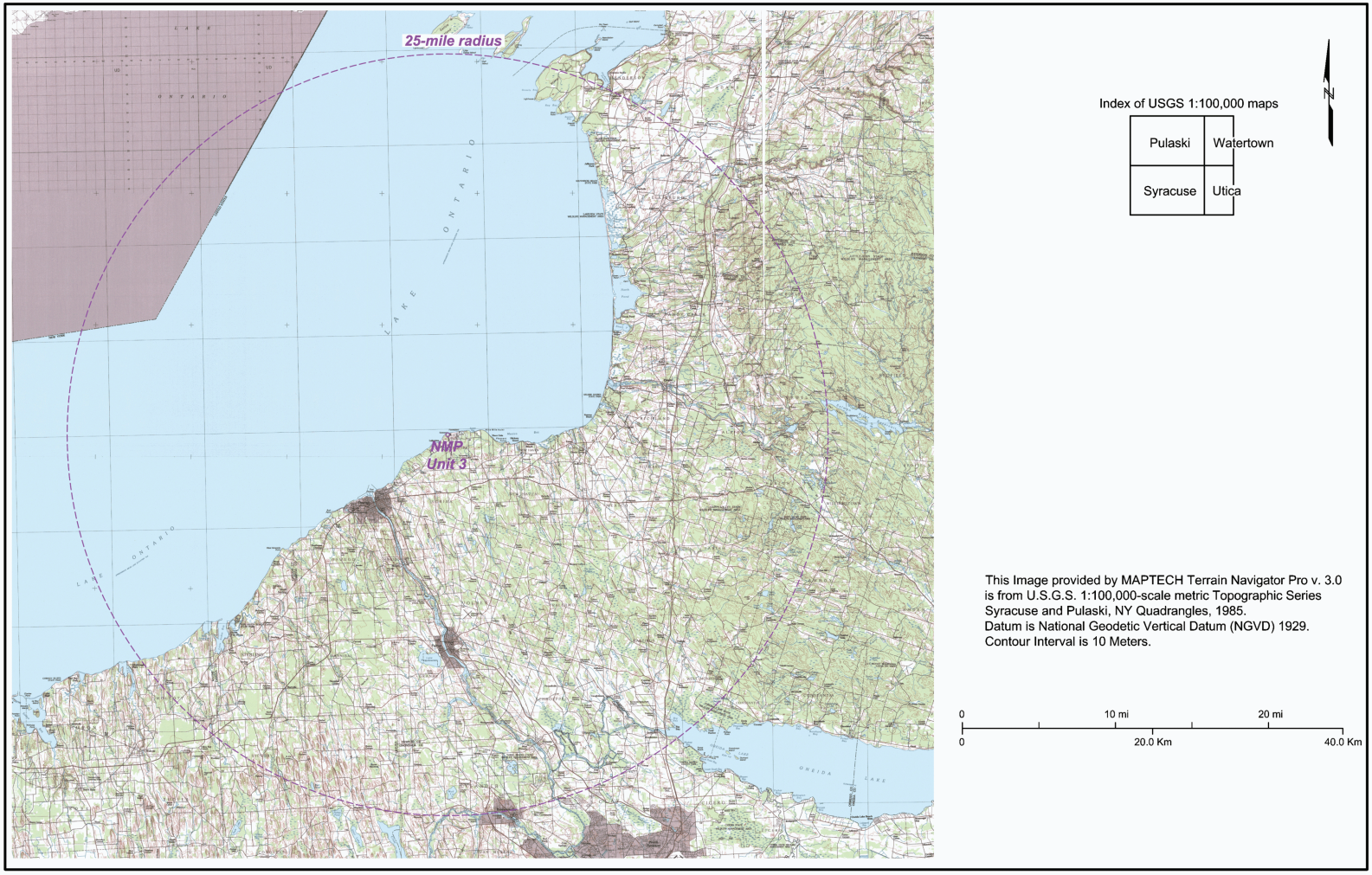


Figure 2.5-41—{Site Area Topographic Map 5-Mile (8-Km) Radius}

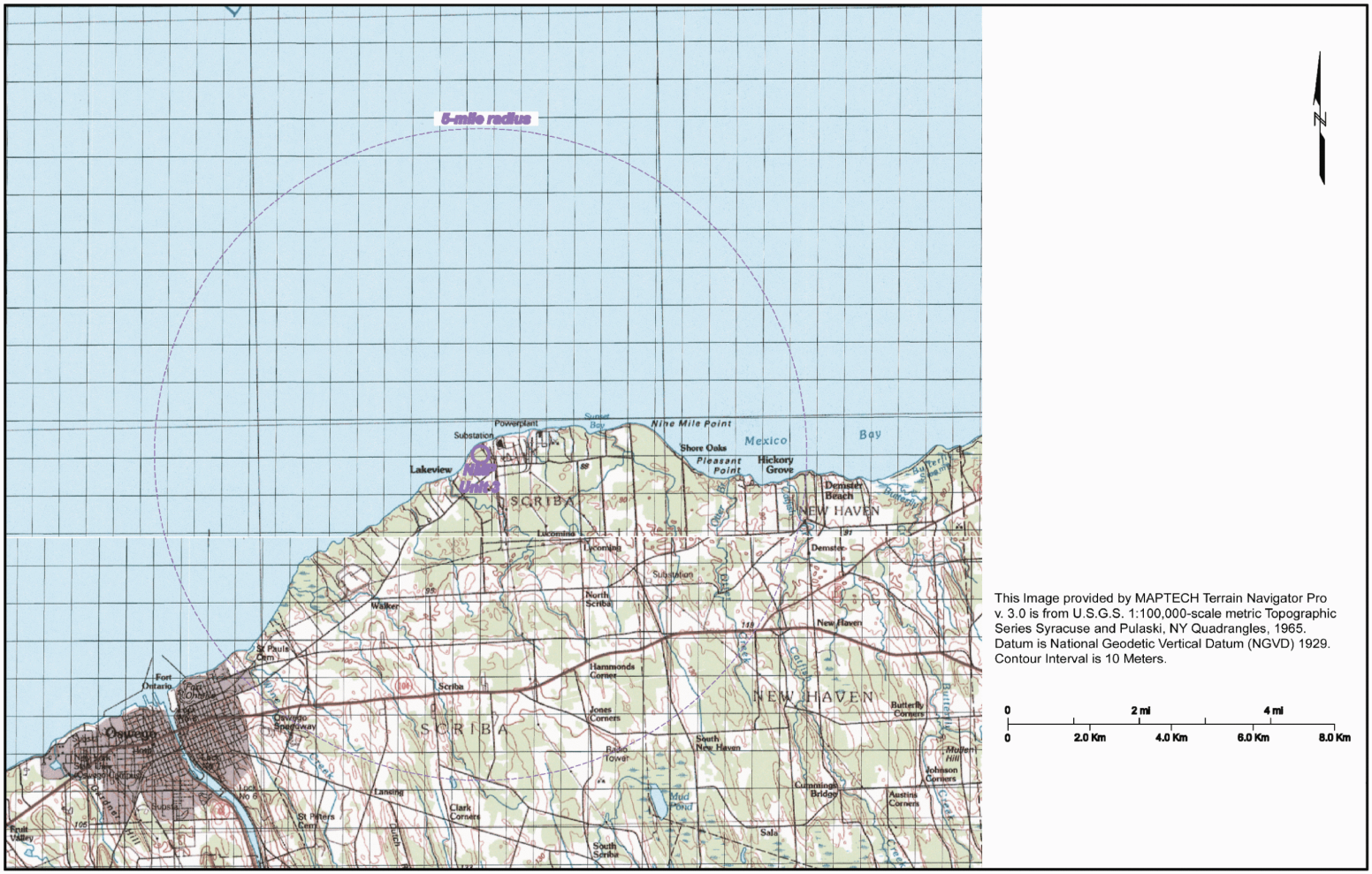
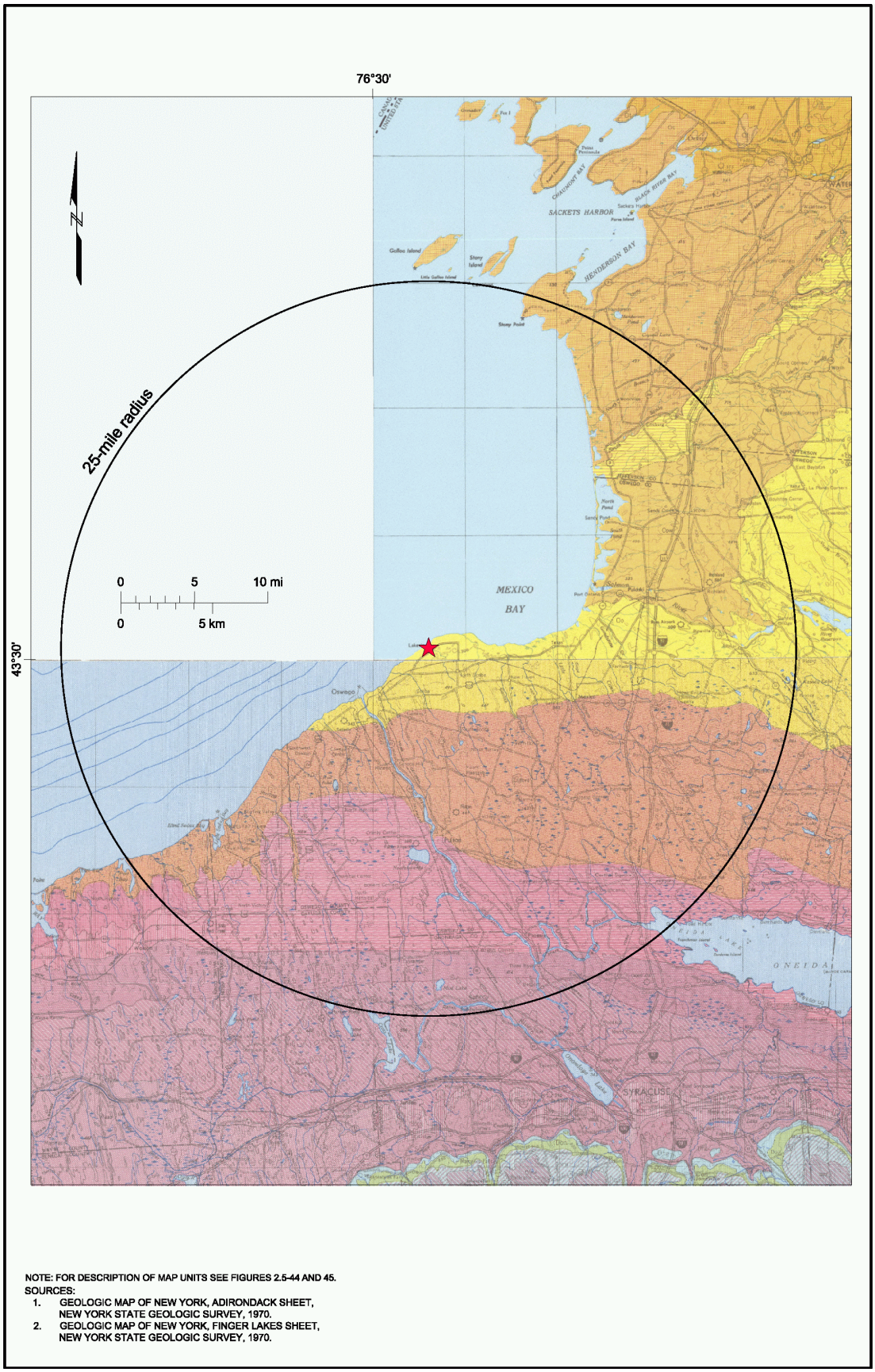


Figure 2.5-42—{Site Topographic Map 0.6-Mile (1-Km) Radius}

Figure 2.5-43—{Site Vicinity Geologic Map 25-Mile (40-Km) Radius}



NOTE: FOR DESCRIPTION OF MAP UNITS SEE FIGURES 2.5-44 AND 45.
SOURCES:
1. GEOLOGIC MAP OF NEW YORK, ADIRONDACK SHEET, NEW YORK STATE GEOLOGIC SURVEY, 1970.
2. GEOLOGIC MAP OF NEW YORK, FINGER LAKES SHEET, NEW YORK STATE GEOLOGIC SURVEY, 1970.

Figure 2.5-44—{Site Vicinity Geologic Map 25-Mile (40-Km) Radius Unit Descriptions - Adirondack Sheet}

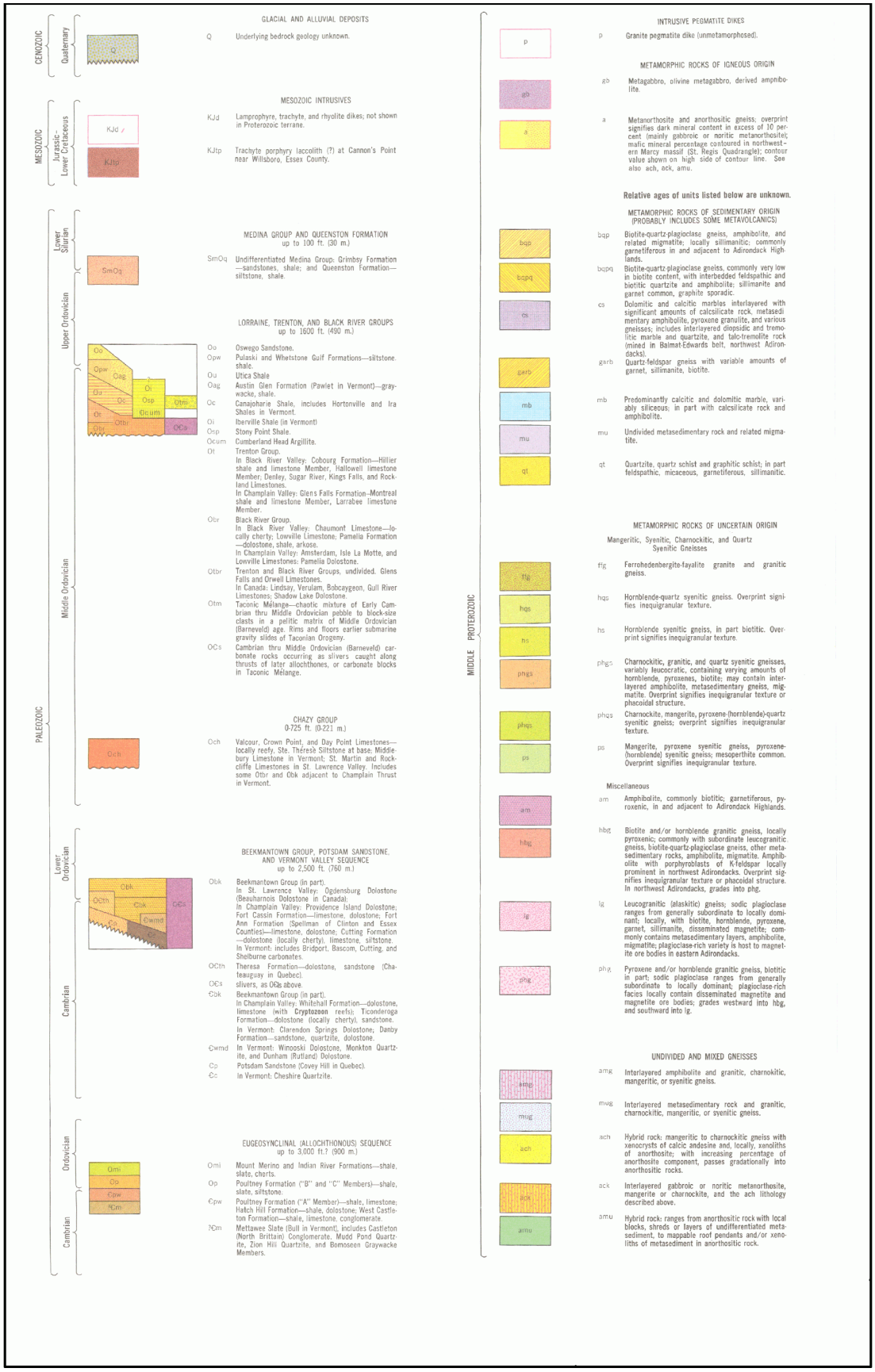


Figure 2.5-45—{Site Vicinity Geologic Map 25-Mile (40-Km) Radius Unit Descriptions - Finger Lakes Sheet}

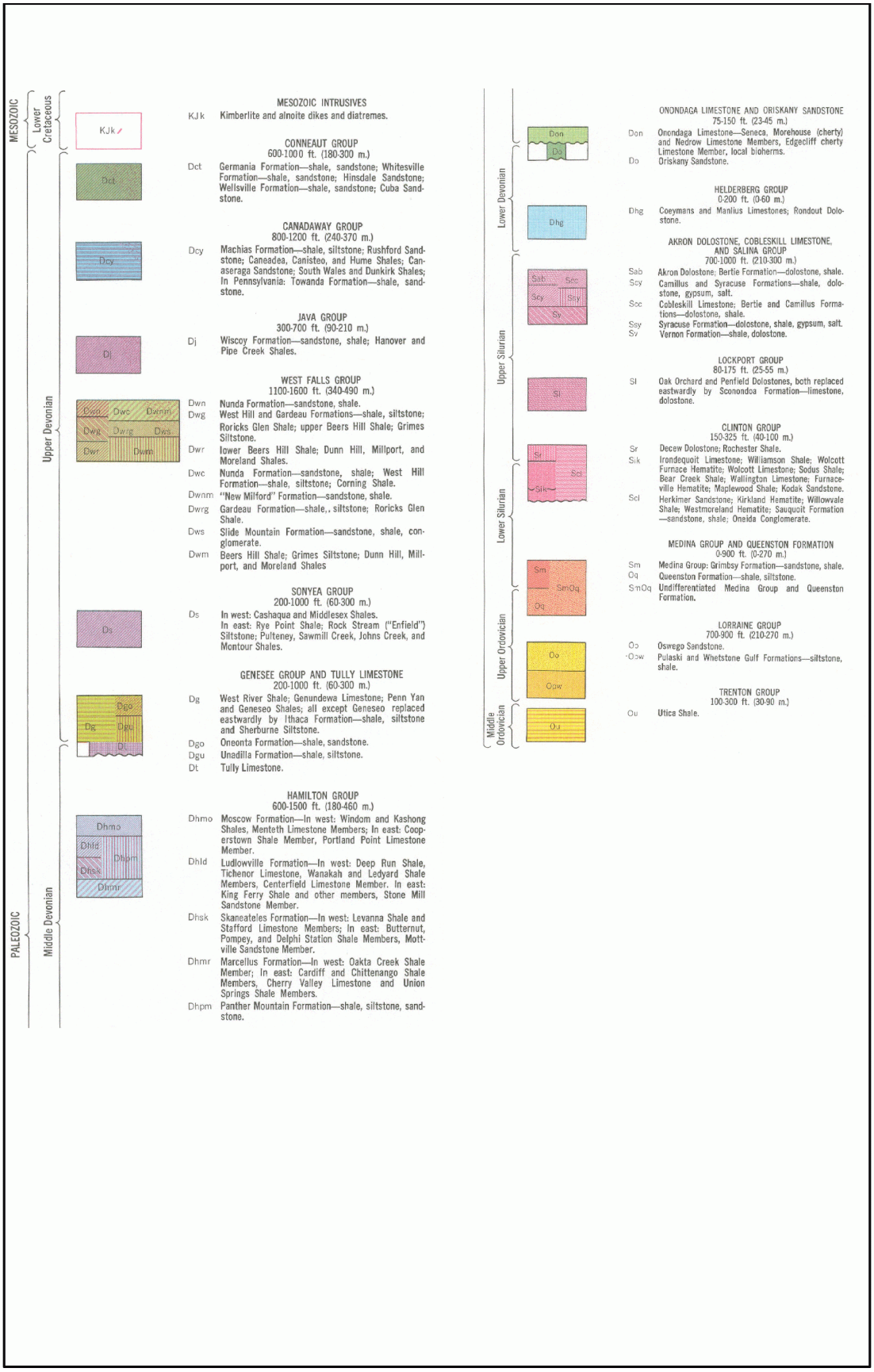


Figure 2.5-46—{Site Area Geologic Map 5-Mile (8-Km) Radius}

NOTE: FOR DESCRIPTION OF MAP UNITS SEE FIGURES 2.5-47 AND 48.

SOURCES:

1. GEOLOGIC MAP OF NEW YORK, ADIRONDACK SHEET, NEW YORK STATE GEOLOGIC SURVEY, 1970.
2. GEOLOGIC MAP OF NEW YORK, FINGER LAKES SHEET, NEW YORK STATE GEOLOGIC SURVEY, 1970.

Figure 2.5-47—{Site Area Geologic Map 5-Mile (8-Km) Radius Unit Descriptions - Adirondack Sheet}

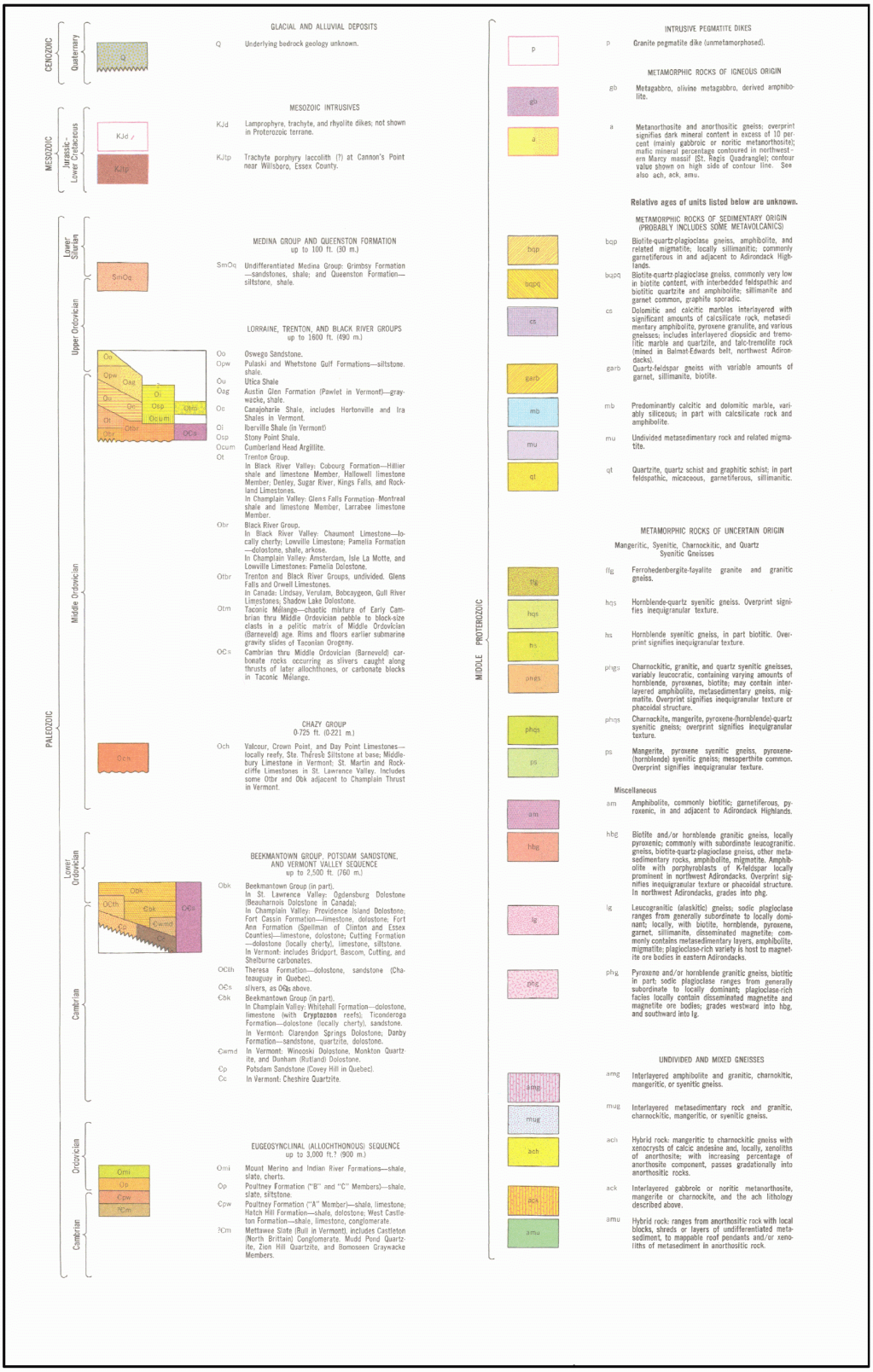


Figure 2.5-48—{Site Area Geologic Map 5-Mile (8-Km) Radius Unit Descriptions - Finger Lakes Sheet}

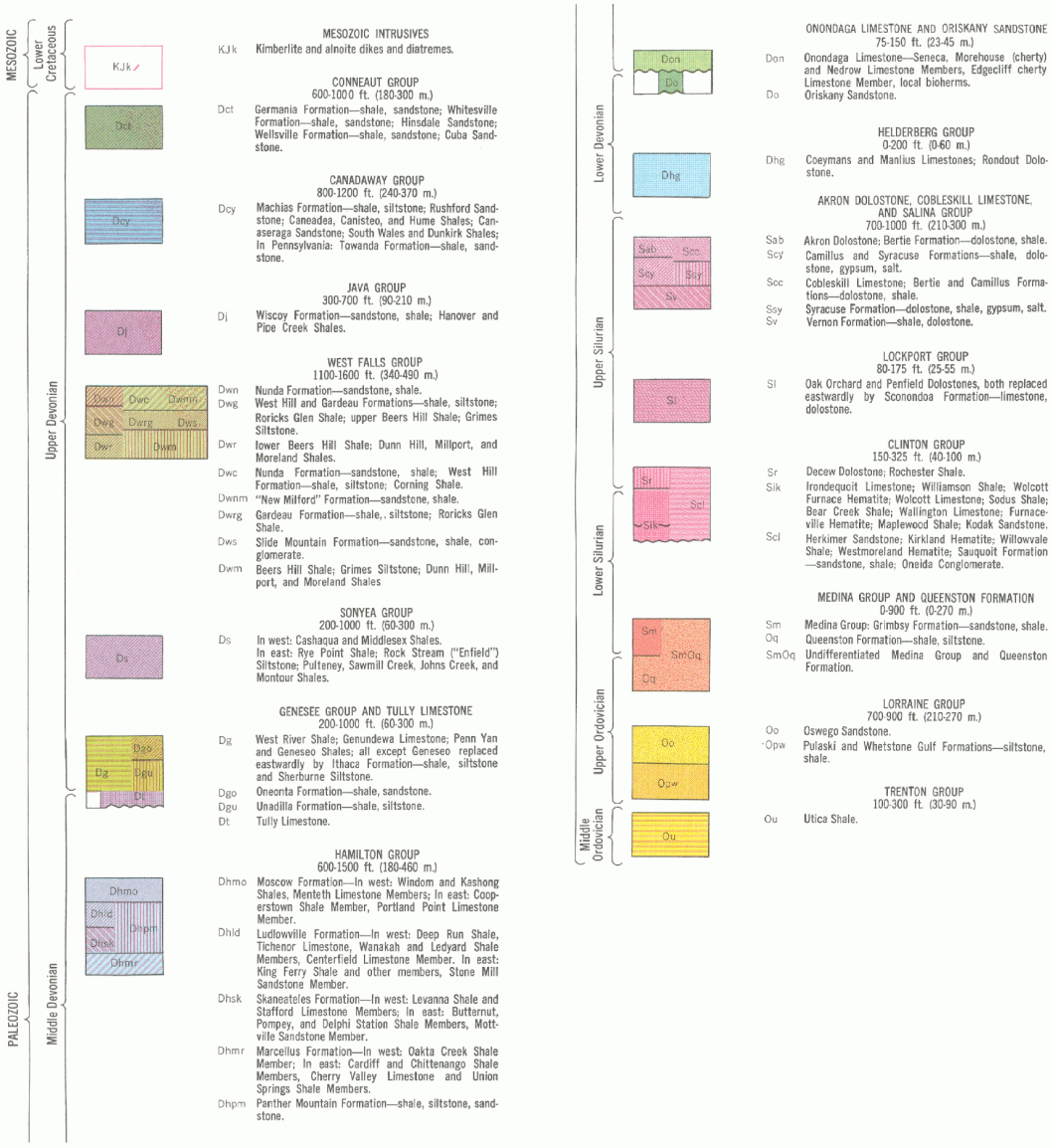
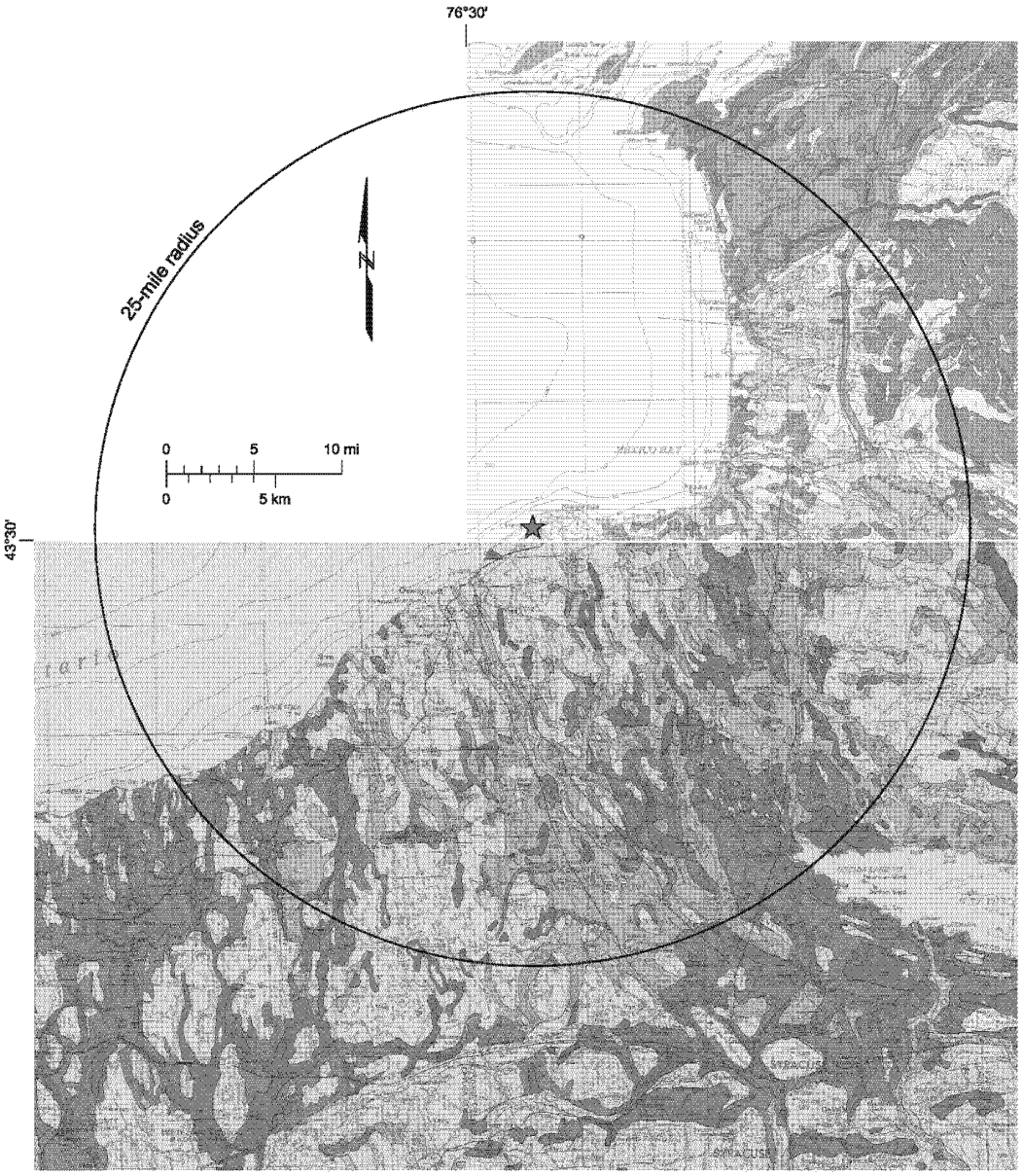


Figure 2.5-49—{Site Vicinity Surficial Geologic Map 25-Mile (40-Km) Radius}



NOTE: FOR DESCRIPTION OF MAP UNITS SEE FIGURES 2.5-50 AND 51.

SOURCE:
1. SURFICIAL GEOLOGIC MAP OF NEW YORK, ADIRONDACK SHEET, NEW YORK STATE GEOLOGIC SURVEY, 1991.
2. SURFICIAL GEOLOGIC MAP OF NEW YORK, FINGER LAKES SHEET, NEW YORK STATE GEOLOGIC SURVEY, 1986.

Figure 2.5-50—{Site Vicinity Surficial Geologic Map 25-Mile (40-Km) Radius Unit Descriptions - Adirondack Sheet}

EXPLANATION

HOLOCENE

af — **Artificial fill**

al — **Recent alluvium**
Oxidized fine sand to gravel, permeable,
generally confined to floodplains within a valley,
in larger valleys may be overlain by silt,
subject to flooding, thickness 1-10 meters,

alf — **Alluvial fan**
Poorly stratified silt, sand, and boulders,
fan shaped accumulations,
at bottoms of steep slopes,
generally permeable, thickness 1-10 meters.

alt — **Alluvial terrace**
Fluvial sand and gravel,
occasional laterally continuous lenses of silt,
remnants of earlier higher floodplains,
generally permeable, thickness 1-10 meters.

d — **Dunes**
Fine to medium sands,
well sorted, stratified,
generally wind-reworked lake sediment,
permeable, well drained,
thickness 1-10 meters.

pm — **Swamp deposits**
Peat-muck, organic silt and sand in poorly drained areas,
unoxidized,
commonly overlies marl and lake silt,
potential land instability,
thickness 2-20 meters.

alp — **Pleistocene alluvium**

lb — **Lacustrine beach**
Generally well sorted sand and gravel,
stratified, permeable and well drained,
deposited at lake shoreline,
generally non-calcareous,
may have wave-winnowed lag gravel,
thickness variable (1-5 meters).

mb — **Marine beach**
Generally well sorted sand and gravel,
elevation at or below highest marine level,
permeable and well drained,
may be fossiliferous,
deposited in brackish to salt water,
thickness variable (1-5 meters).

ld — **Lacustrine delta**
Coarse to fine gravel and sand,
stratified, generally well sorted, permeable,
deposited at a lake shoreline,
thickness variable (3-15 meters).

md — **Marine delta**
Coarse to fine gravel and sand,
elevation at or below highest marine level,
stratified, generally well sorted,
deposited in brackish to salt water,
permeable, thickness variable (3-15 meters).

lsc — **Lacustrine silt and clay**
Generally laminated silt and clay,
deposited in proglacial lakes,
generally calcareous, low permeability,
potential land instability,
thickness variable (up to 50 meters).

sc — **Undifferentiated marine and lacustrine silt and clay**
Elevation within highest marine level,
generally laminated to massive silt and clay,
may include fossil shells,
deposited in brackish to salt water,
low permeability, potential land instability,
thickness variable (up to 50 meters).

ls — **Lacustrine sand**
Generally quartz sand, well sorted, stratified,
usually deposited in proglacial lakes,
but may have been deposited on remnant ice,
generally a near-shore deposit or near a sand source,
permeable, thickness variable (2-20 meters).

s — **Undifferentiated marine and lacustrine sand**
Well sorted, stratified, fine to medium sand,
generally a near-shore deposit,
at or below highest marine level,
may include fossil shells,
may be a brackish to salt water deposit,
permeable, thickness variable (2-20 meters).

PLEISTOCENE

d — **Wind-deposited sand**
Fine to medium sand,
well sorted, stratified,
generally wind-reworked lake sediments,
permeable, well drained,
thickness variable (1-10 meters).

og — **Outwash sand and gravel**
Coarse to fine gravel with sand,
proglacial fluvial deposition,
well rounded and stratified,
generally finer texture away from ice border,
permeable, thickness variable (2-20 meters).

fg — **Fluvial sand and/or gravel**
Sand and/or gravel,
occasional laterally continuous lenses of silt,
deposition farther from glacier than outwash,
age and proximity to ice uncertain,
permeable, thickness variable (1-20 meters).

k — **Kame deposits**
Coarse to fine gravel and/or sand,
includes kames, eskers, kame terraces, kame deltas,
ice contact, or ice cored deposition,
lateral variability in sorting, texture
and permeability,
may be firmly cemented with calcareous cement,
thickness variable (10-30 meters).

ki — **Inwash**
Coarse to fine gravel and/or sand,
interpreted as alluvium
deposited adjacent to active or remnant ice
by streams of nonglacial origin,
thickness variable (2-20 meters).

ali — **Alluvial inwash**
Deposited between active or remnant glacier ice
and draped on adjacent valley wall,
lacks kettles, permeability varies,
thickness variable (2-10 meters).

sf — **Subaqueous fan**
Coarse to fine gravel and/or sand,
variable texture and sorting,
deposited adjacent to glacier with
englacial or subglacial conduit debouching in deep water,
thickness variable (5-30 meters).

km — **Kame moraine**
Variable texture (size and sorting) from boulders to sand,
deposition at an active ice margin during retreat,
constructional kame and kettle topography,
locally, calcareous cement,
thickness variable (10-30 meters).

tm — **Till moraine**
Variable texture (size and sorting),
generally low permeability,
deposition adjacent to ice,
thickness variable (10-30 meters).

ta — **Ablation moraine**
Till, deposited by downwasting,
with minor amounts of sand and silt,
deposition during final melting of glacier,
thickness variable (1-10 meters).

t — **Till**
Variable texture (boulders to silt),
usually poorly sorted sand-rich diamict,
deposition beneath glacier ice,
permeability varies with compaction,
thickness variable (1-50 meters).

Adirondack till: generally sand-rich diamict,
metamorphic provenance.
Ontario-St. Lawrence-Champlain till:
generally silty clay to silt loam,
sedimentary provenance.
Tug Hill till: generally stony silt-clay to sandy silt,
differentiated from "ta" in this region,
sedimentary provenance.

PRE-PLEISTOCENE

r — **Bedrock**
Exposed or generally within 1 meter of surface,
in some areas saprolite is preserved.

Bedrock stipple overprint
Bedrock may be within 1-3 meters of surface,
may sporadically crop out,
variable mantle of rock debris, glacial till,
lacustrine or marine sediments.

Figure 2.5-51—{Site Vicinity Surficial Geologic Map 25-Mile (40-Km) Radius Unit Descriptions - Finger Lakes Sheet}

EXPLANATION

al – **Recent deposits**
Generally confined to floodplains within a valley,
oxidized, non-calcareous, fine sand to gravel,
in larger valleys may be overlain by silt,
subject to frequent flooding, thickness 1-10 meters.

alf – **alluvial fan**

pm – **Swamp deposits**
Peat-muck, organic silt and sand in poorly drained areas,
unoxidized,
may be overlying marl and lake silts,
potential land instability,
thickness generally 2-20 meters.

d – **Dunes**
Fine to medium sand,
well-sorted, stratified,
non-calcareous, unconsolidated,
generally wind-reworked lake sediments,
permeable, well-drained,
thickness variable (1-10 meters).

lb – **Lacustrine beach**
Generally well-sorted sand and gravel,
stratified, permeable and well-drained,
deposited at a lake shoreline,
generally non-calcareous,
wave-winnowed lag gravel in isolated drumlin localities,
thickness variable (2-10 meters).

ld – **Lacustrine delta**
Coarse to fine gravel and sand,
stratified, generally well-sorted,
deposited at a lake shoreline,
thickness variable (3-15 meters).

lsc – **Lacustrine silt and clay**
Generally laminated clay and silt
deposited in proglacial lakes,
generally calcareous,
potential land instability,
thickness variable (up to 50 meters).

ls – **Lacustrine sand**
Sand deposits associated with large bodies of water,
generally a near-shore deposit or near a sand source,
well-sorted, stratified,
generally quartz sand,
thickness variable (2-20 meters).

og – **Outwash sand and gravel**
Coarse to fine gravel with sand,
proglacial fluvial deposition,
well-rounded and stratified,
generally finer texture away from ice border,
thickness variable (2-20 meters).

k – **Kame deposits**
Includes kames, eskers, kame terraces, kame deltas,
coarse to fine gravel and/or sand,
deposition adjacent to ice,
lateral variability in sorting, coarseness and thickness,
locally firmly cemented with calcareous cement,
thickness variable (10-30 meters).

km – **Kame moraine**
Variable texture (size and sorting) from boulders to sand,
deposition at an ice margin during deglaciation,
locally cemented with calcareous cement,
thickness variable (10-30 meters).

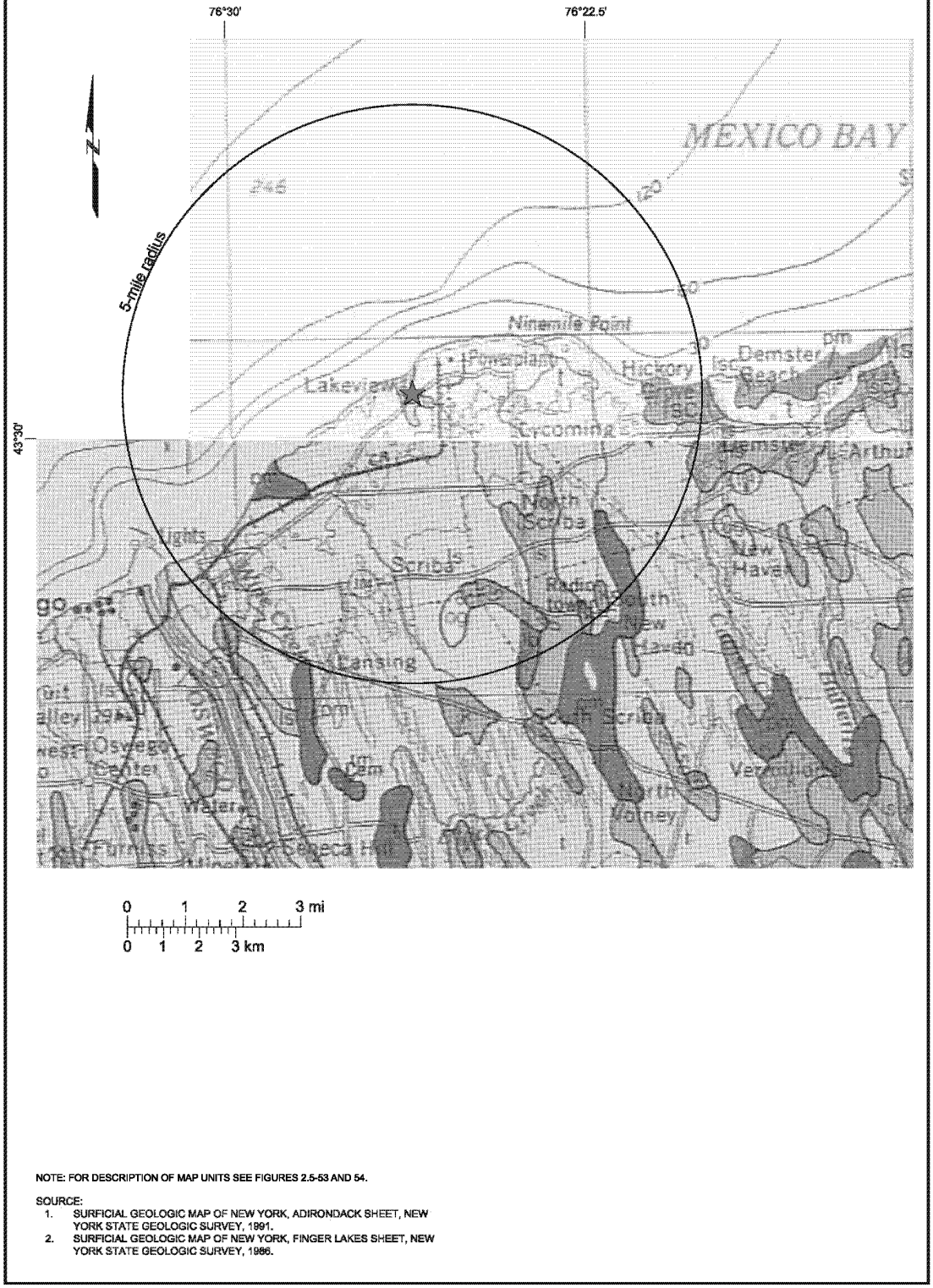
tm – **Till moraine**
Much like till, but more variable in sorting,
generally more permeable than till,
deposition adjacent to ice,
more variably drained,
may be ablation till,
thickness variable (10-30 meters).

t – **Till**
Variable texture (e.g. clay, silt-clay, boulder clay),
usually poorly sorted diamict,
deposition beneath glacier ice,
generally calcareous in northern part of map,
relatively impermeable (loamy matrix),
variable clast content – ranging from abundant well-rounded diverse lithologies in valley tills to relatively angular, more limited lithologies in upland tills,
potential land instability on steep slopes,
thickness variable (1-50 meters).

r – **Bedrock**
Exposed or within 1 meter of surface,
the following types of rock may be exposed:
Paleozoic limestone, sandstone, shale.

Bedrock stipple overprint
bedrock may be within 1-3 meters of surface,
may sporadically crop out,
variable mantle of rock debris and glacial till.

Figure 2.5-52—{Site Area Surficial Geologic Map 5-Mile (8-Km) Radius }



NOTE: FOR DESCRIPTION OF MAP UNITS SEE FIGURES 2.5-53 AND 54.

SOURCE:
1. SURFICIAL GEOLOGIC MAP OF NEW YORK, ADIRONDACK SHEET, NEW YORK STATE GEOLOGIC SURVEY, 1991.
2. SURFICIAL GEOLOGIC MAP OF NEW YORK, FINGER LAKES SHEET, NEW YORK STATE GEOLOGIC SURVEY, 1986.

Figure 2.5-53—{Site Area Surficial Geologic Map 5-Mile (8-Km) Radius Unit Descriptions - Adirondack Sheet}

EXPLANATION

HOLOCENE

af — **Artificial fill**

al — **Recent alluvium**
Oxidized fine sand to gravel, permeable,
generally confined to floodplains within a valley,
in larger valleys may be overlain by silt,
subject to flooding, thickness 1-10 meters,

alf — **Alluvial fan**
Poorly stratified silt, sand, and boulders,
fan shaped accumulations,
at bottoms of steep slopes,
generally permeable, thickness 1-10 meters.

alt — **Alluvial terrace**
Fluvial sand and gravel,
occasional laterally continuous lenses of silt,
remnants of earlier higher floodplains,
generally permeable, thickness 1-10 meters.

d — **Dunes**
Fine to medium sands,
well sorted, stratified,
generally wind-reworked lake sediment,
permeable, well drained,
thickness 1-10 meters.

pm — **Swamp deposits**
Peat-muck, organic silt and sand in poorly drained areas,
unoxidized,
commonly overlies marl and lake silt,
potential land instability,
thickness 2-20 meters.

alp — **Pleistocene alluvium**

lb — **Lacustrine beach**
Generally well sorted sand and gravel,
stratified, permeable and well drained,
deposited at lake shoreline,
generally non-calcareous,
may have wave-winnowed lag gravel,
thickness variable (1-5 meters).

mb — **Marine beach**
Generally well sorted sand and gravel,
elevation at or below highest marine level,
permeable and well drained,
may be fossiliferous,
deposited in brackish to salt water,
thickness variable (1-5 meters).

ld — **Lacustrine delta**
Coarse to fine gravel and sand,
stratified, generally well sorted, permeable,
deposited at a lake shoreline,
thickness variable (3-15 meters).

md — **Marine delta**
Coarse to fine gravel and sand,
elevation at or below highest marine level,
stratified, generally well sorted,
deposited in brackish to salt water,
permeable, thickness variable (3-15 meters).

lsc — **Lacustrine silt and clay**
Generally laminated silt and clay,
deposited in proglacial lakes,
generally calcareous, low permeability,
potential land instability,
thickness variable (up to 50 meters).

sc — **Undifferentiated marine and lacustrine silt and clay**
Elevation within highest marine level,
generally laminated to massive silt and clay,
may include fossil shells,
deposited in brackish to salt water,
low permeability, potential land instability,
thickness variable (up to 50 meters).

ls — **Lacustrine sand**
Generally quartz sand, well sorted, stratified,
usually deposited in proglacial lakes,
but may have been deposited on remnant ice,
generally a near-shore deposit or near a sand source,
permeable, thickness variable (2-20 meters).

s — **Undifferentiated marine and lacustrine sand**
Well sorted, stratified, fine to medium sand,
generally a near-shore deposit,
at or below highest marine level,
may include fossil shells,
may be a brackish to salt water deposit,
permeable, thickness variable (2-20 meters).

PLEISTOCENE

d — **Wind-deposited sand**
Fine to medium sand,
well sorted, stratified,
generally wind-reworked lake sediments,
permeable, well drained,
thickness variable (1-10 meters).

og — **Outwash sand and gravel**
Coarse to fine gravel with sand,
proglacial fluvial deposition,
well rounded and stratified,
generally finer texture away from ice border,
permeable, thickness variable (2-20 meters).

fg — **Fluvial sand and/or gravel**
Sand and/or gravel,
occasional laterally continuous lenses of silt,
deposition farther from glacier than outwash,
age and proximity to ice uncertain,
permeable, thickness variable (1-20 meters).

k — **Kame deposits**
Coarse to fine gravel and/or sand,
includes kames, eskers, kame terraces, kame deltas,
ice contact, or ice cored deposition,
lateral variability in sorting, texture
and permeability,
may be firmly cemented with calcareous cement,
thickness variable (10-30 meters).

ki — **Inwash**
Coarse to fine gravel and/or sand,
interpreted as alluvium
deposited adjacent to active or remnant ice
by streams of nonglacial origin,
thickness variable (2-20 meters).

ali — **Alluvial inwash**
Deposited between active or remnant glacier ice
and draped on adjacent valley wall,
lacks kettles, permeability varies,
thickness variable (2-10 meters).

sf — **Subaqueous fan**
Coarse to fine gravel and/or sand,
variable texture and sorting,
deposited adjacent to glacier with
englacial or subglacial conduit debouching in deep water,
thickness variable (5-30 meters).

km — **Kame moraine**
Variable texture (size and sorting) from boulders to sand,
deposition at an active ice margin during retreat,
constructional kame and kettle topography,
locally, calcareous cement,
thickness variable (10-30 meters).

tm — **Till moraine**
Variable texture (size and sorting),
generally low permeability,
deposition adjacent to ice,
thickness variable (10-30 meters).

ta — **Ablation moraine**
Till, deposited by downwasting,
with minor amounts of sand and silt,
deposition during final melting of glacier,
thickness variable (1-10 meters).

t — **Till**
Variable texture (boulders to silt),
usually poorly sorted sand-rich diamict,
deposition beneath glacier ice,
permeability varies with compaction,
thickness variable (1-50 meters).

Adirondack till: generally sand-rich diamict,
metamorphic provenance.
Ontario-St. Lawrence-Champlain till:
generally silty clay to silt loam,
sedimentary provenance.
Tug Hill till: generally stony silt-clay to sandy silt,
differentiated from "ta" in this region,
sedimentary provenance.

PRE-PLEISTOCENE

r — **Bedrock**
Exposed or generally within 1 meter of surface,
in some areas saprolite is preserved.

Bedrock stipple overprint
Bedrock may be within 1-3 meters of surface,
may sporadically crop out,
variable mantle of rock debris, glacial till,
lacustrine or marine sediments.

Figure 2.5-54—{Site Area Surficial Geologic Map 5-Mile (8-Km) Radius Unit Descriptions - Finger Lakes Sheet}

EXPLANATION

al - **Recent deposits**
Generally confined to floodplains within a valley,
oxidized, non-calcareous, fine sand to gravel,
in larger valleys may be overlain by silt,
subject to frequent flooding, thickness 1-10 meters.

alf - **alluvial fan**

pm - **Swamp deposits**
Peat-muck, organic silt and sand in poorly drained areas,
unoxidized,
may be overlying marl and lake silts,
potential land instability,
thickness generally 2-20 meters.

d - **Dunes**
Fine to medium sand,
well-sorted, stratified,
non-calcareous, unconsolidated,
generally wind-reworked lake sediments,
permeable, well-drained,
thickness variable (1-10 meters).

lb - **Lacustrine beach**
Generally well-sorted sand and gravel,
stratified, permeable and well-drained,
deposited at a lake shoreline,
generally non-calcareous,
wave-winnowed lag gravel in isolated drumlin localities,
thickness variable (2-10 meters).

ld - **Lacustrine delta**
Coarse to fine gravel and sand,
stratified, generally well-sorted,
deposited at a lake shoreline,
thickness variable (3-15 meters).

lsc - **Lacustrine silt and clay**
Generally laminated clay and silt
deposited in proglacial lakes,
generally calcareous,
potential land instability,
thickness variable (up to 50 meters).

ls - **Lacustrine sand**
Sand deposits associated with large bodies of water,
generally a near-shore deposit or near a sand source,
well-sorted, stratified,
generally quartz sand,
thickness variable (2-20 meters).

og - **Outwash sand and gravel**
Coarse to fine gravel with sand,
proglacial fluvial deposition,
well-rounded and stratified,
generally finer texture away from ice border,
thickness variable (2-20 meters).

k - **Kame deposits**
Includes kames, eskers, kame terraces, kame deltas,
coarse to fine gravel and/or sand,
deposition adjacent to ice,
lateral variability in sorting, coarseness and thickness,
locally firmly cemented with calcareous cement,
thickness variable (10-30 meters).

km - **Kame moraine**
Variable texture (size and sorting) from boulders to sand,
deposition at an ice margin during deglaciation,
locally cemented with calcareous cement,
thickness variable (10-30 meters).

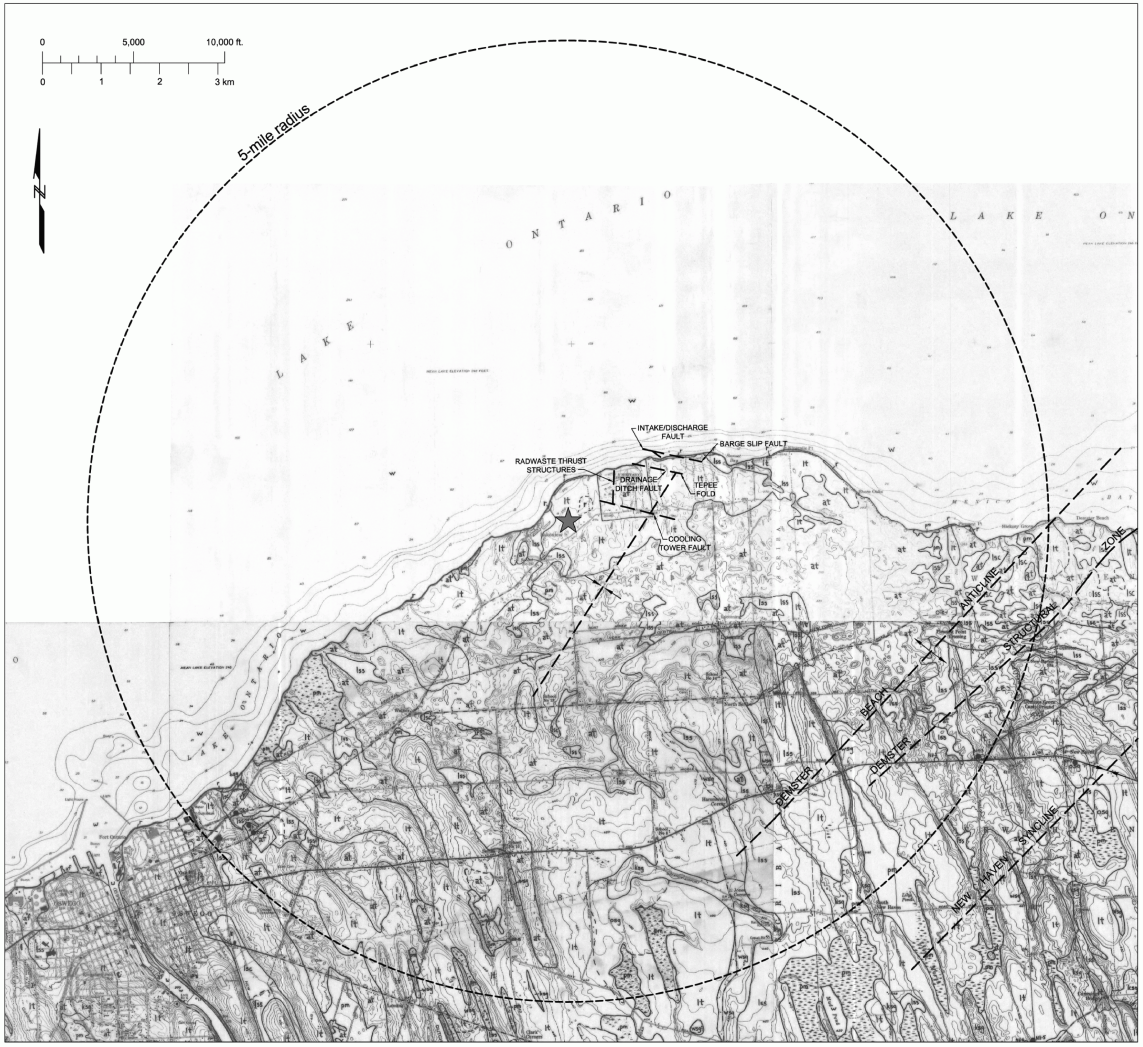
tm - **Till moraine**
Much like till, but more variable in sorting,
generally more permeable than till,
deposition adjacent to ice,
more variably drained,
may be ablation till,
thickness variable (10-30 meters).

t - **Till**
Variable texture (e.g. clay, silt-clay, boulder clay),
usually poorly sorted diamict,
deposition beneath glacier ice,
generally calcareous in northern part of map,
relatively impermeable (loamy matrix),
variable clast content – ranging from abundant well-rounded diverse lithologies in valley tills to relatively angular, more limited lithologies in upland tills,
potential land instability on steep slopes,
thickness variable (1-50 meters).

r - **Bedrock**
Exposed or within 1 meter of surface,
the following types of rock may be exposed:
Paleozoic limestone, sandstone, shale.

Bedrock stipple overprint
bedrock may be within 1-3 meters of surface,
may sporadically crop out,
variable mantle of rock debris and glacial till.

Figure 2.5-55—{Site Area Geologic Map 5-Mile (8-Km) Radius}



EXPLANATION

pm	Peat, marl, muck, and clay; bog deposits of postglacial to recent time. Unsuitable for well construction and commonly contains iron-bearing water.
lss	Lake silt and fine sand; offshore deposits in proglacial or postglacial lakes; thin bedded to massive; low to moderate permeability. Poor to moderate potential for well yields.
at	Ablation till; mixture of clay, silt, sand, and boulders deposited from drift laid down after ice melted beneath it; unconsolidated; noncompact and generally has a slightly coarser texture than lodgement till; variable permeability. Poor to moderate potential for well yields.
lt	Lodgement till; mixture of clay, silt, sand, and boulders deposited at base of glacier; poorly sorted; compact and impermeable. Poor potential for well yields.
r	Bedrock; sedimentary rocks. Low to moderate potential for well yields. The extent of factures and joints is the predominant factor determining potential for well yields.
af	Artificial fill.
w	Open-water areas.

—— Contact - Dashed where approximately located

SOURCE:
SURFICIAL GEOLOGY OF THE WEST MEXICO, NEW HAVEN, OSWEGO WEST, OSWEGO EAST, TEXAS, AND WEST OF TEXAS QUADRANGLE, OSWEGO, NEW YORK, BY ERNEST H. MULLER, DEPARTMENT OF INTERIOR U.S.G.S., 1974

SITE AREA GEOLOGIC MAP
5-MILE (8-Km) RADIUS

Figure 2.5-56—{Site Geologic Map 0.6-Mile (1-Km) Radius}

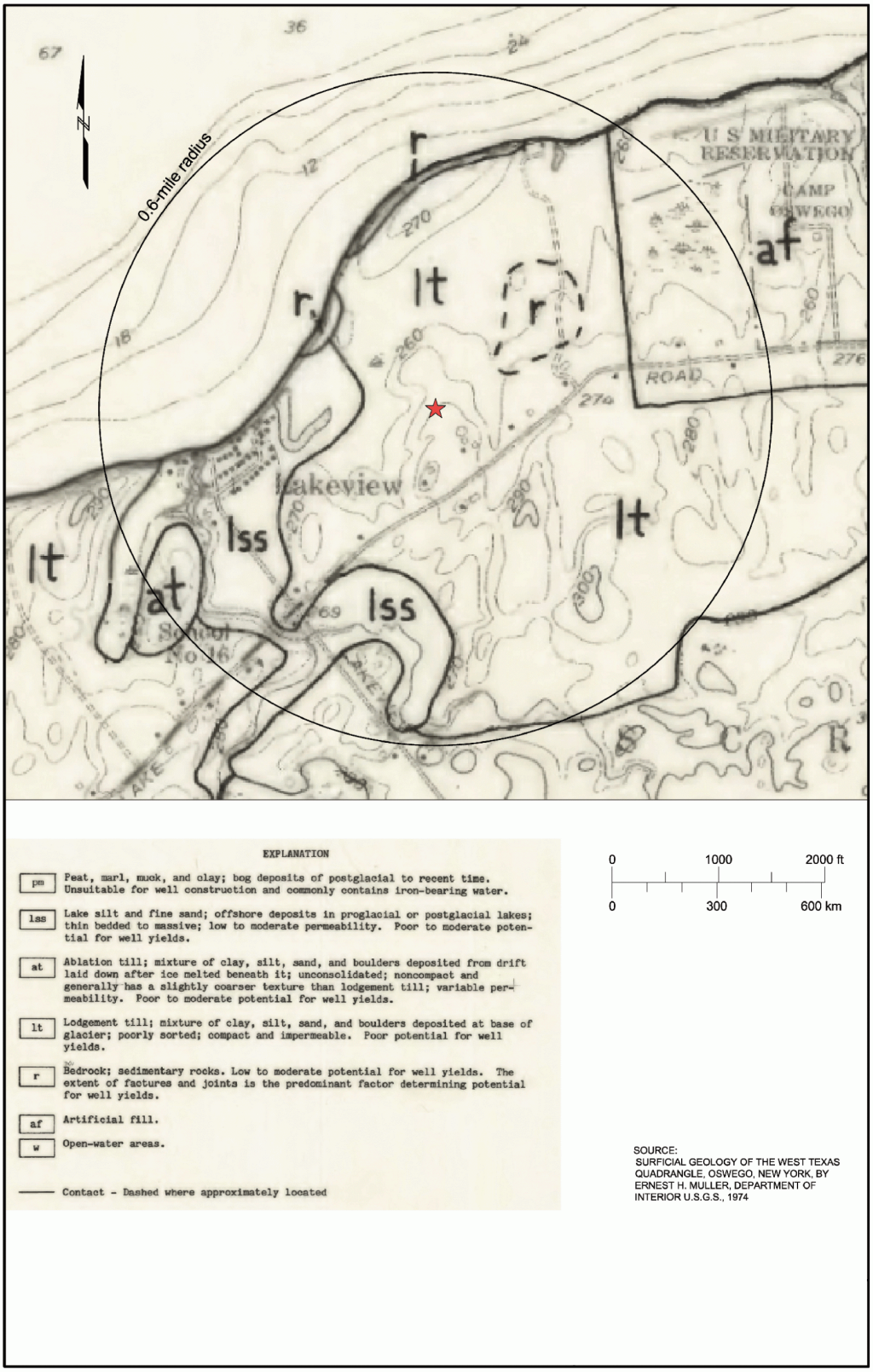


Figure 2.5-57—{NMP Site Specific Stratigraphic Column}

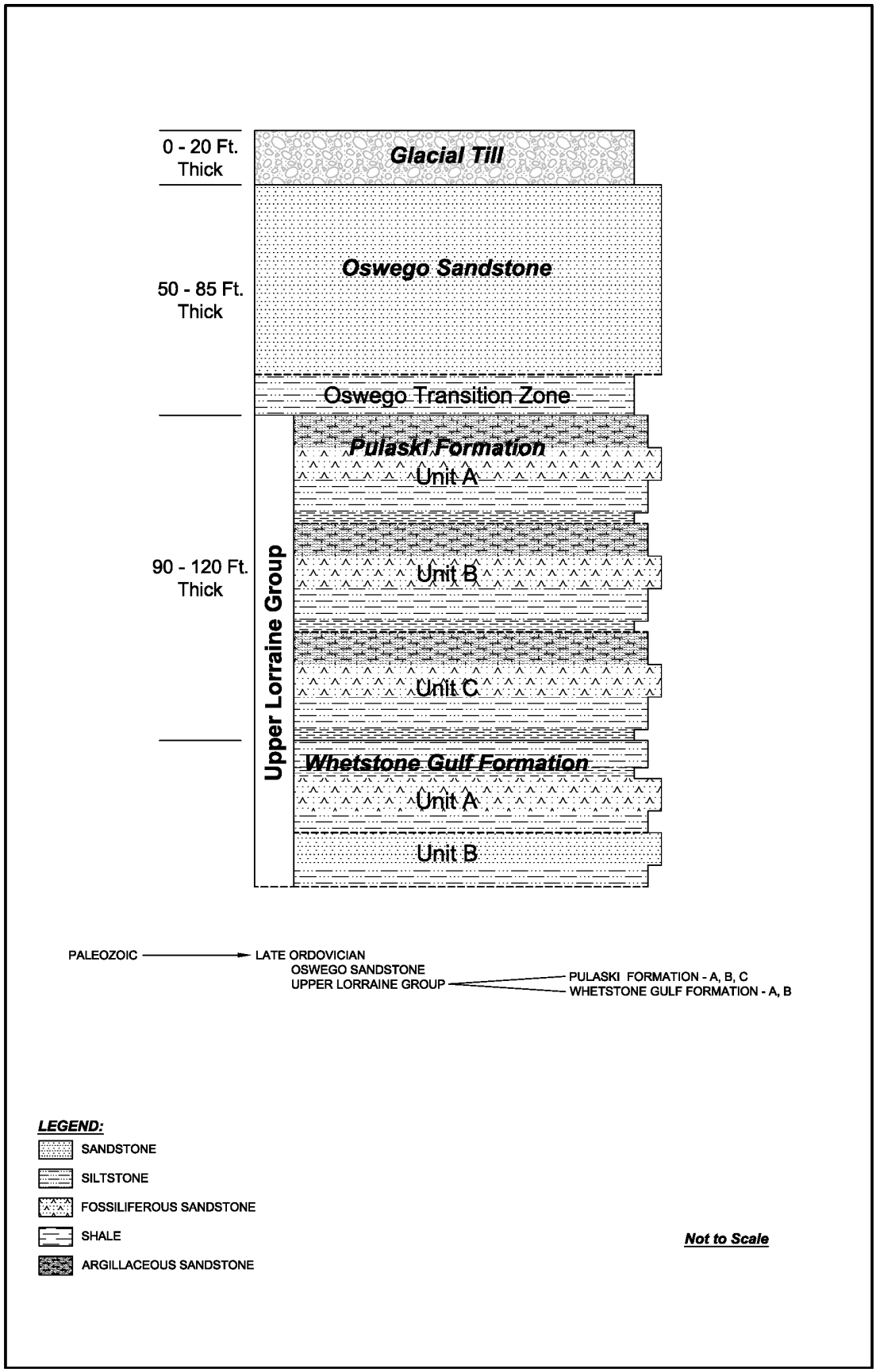


Figure 2.5-58—{Generalized Site Stratigraphy}

EON	ERA	PERIOD	EPOCH	AGE (Ma)	UNIT	THICKNESS (FT.)
Phaneczoic	Cenozoic	Quarternary	Holocene		Topsoil Surficial Soils (Sand, Silt, Clay, Peat) Till	2 - 20
				0.01		
			Pleistocene			
				1.8		
					NA	—
				2.6		
					NA	—
				65.5		
	Mesozoic	Cretaecous			NA	—
				145.5		
		Jurassic			NA	—
				199.6		
		Triassic			NA	—
				251.1		
	Paleozoic	Permian			NA	—
				299.0		
		Carboniferous			NA	—
				359.2		
		Devonian			NA	—
				416.0		
		Silurian			NA	—
				443.7	Unconformity	
		Ordovician	Upper		Oswego Sandstone	50 - 85
					Pulaski Formation	90 - 120
					Whetstone Gulf Formation	~ 784
					Trenton Group - - - - - - - - - - - - Black River Group	800 ± 200
				460.9		
			Middle		NA	—
				471.8		
			Lower		NA	—
				488.3		
		Cambrian			NA	—
				542.0	Unconformity	
Precambrian	Proterozoic	Neo-proterozoic			Grenville-gneiss	Unknown

Time scale modified from "A Geologic Time Scale 2004"
by F.M. Gradstein, J.G. Ogg, A.G. Smith et al. 2004.

Figure 2.5-59—{Site Plan}

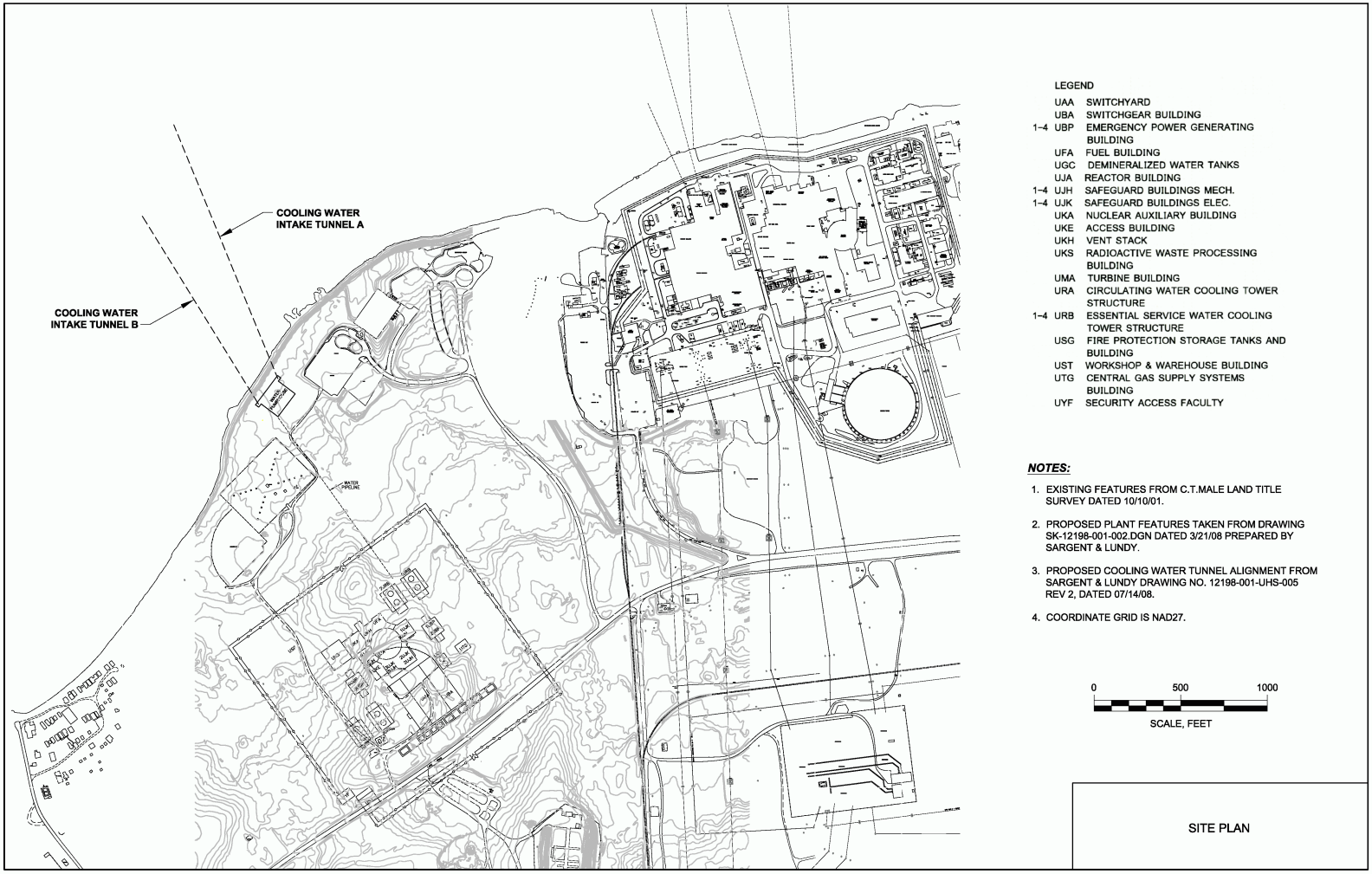


Figure 2.5-60—{Exploration Plan 100 and 300 Series Borings (North)}

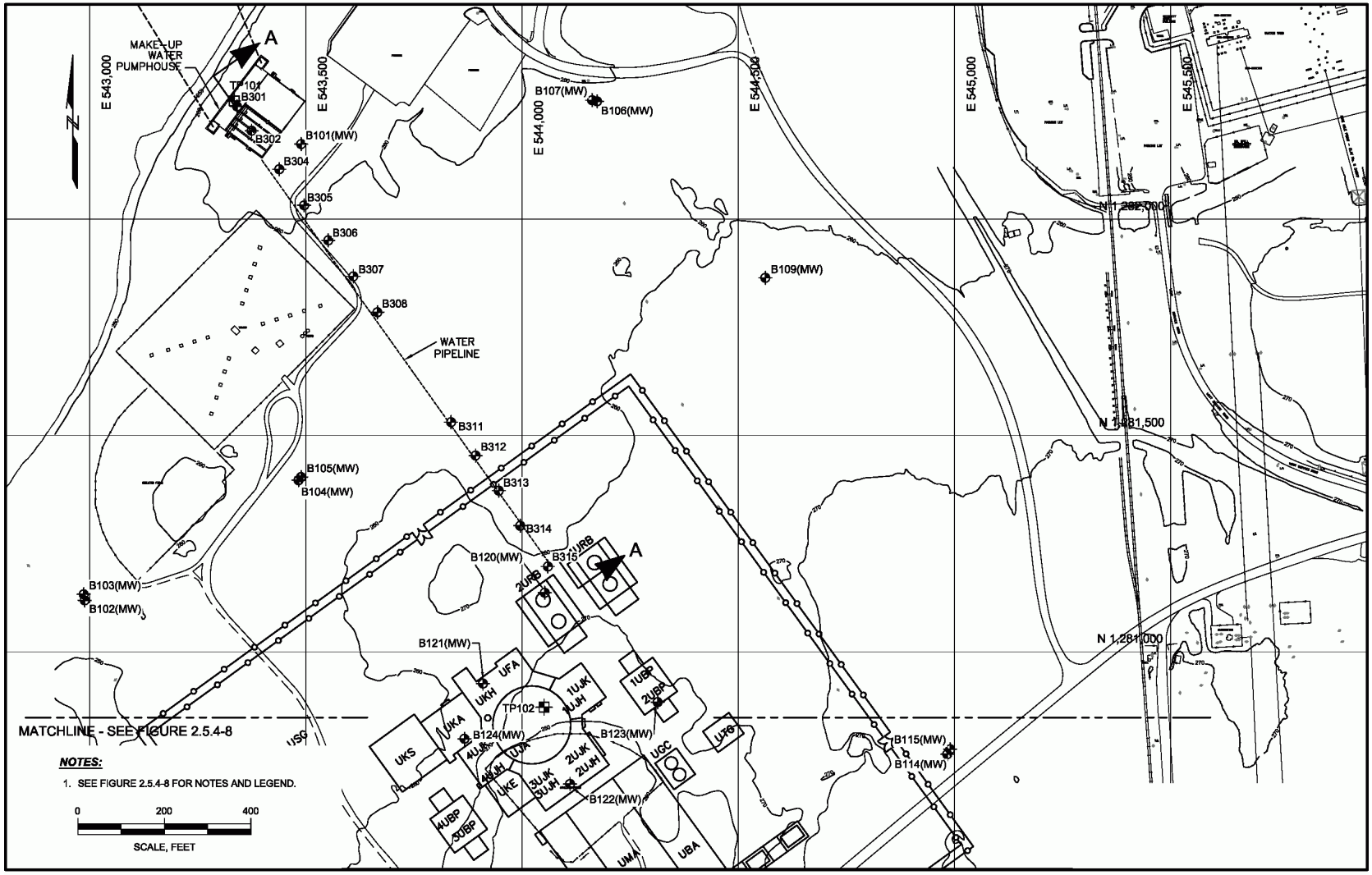
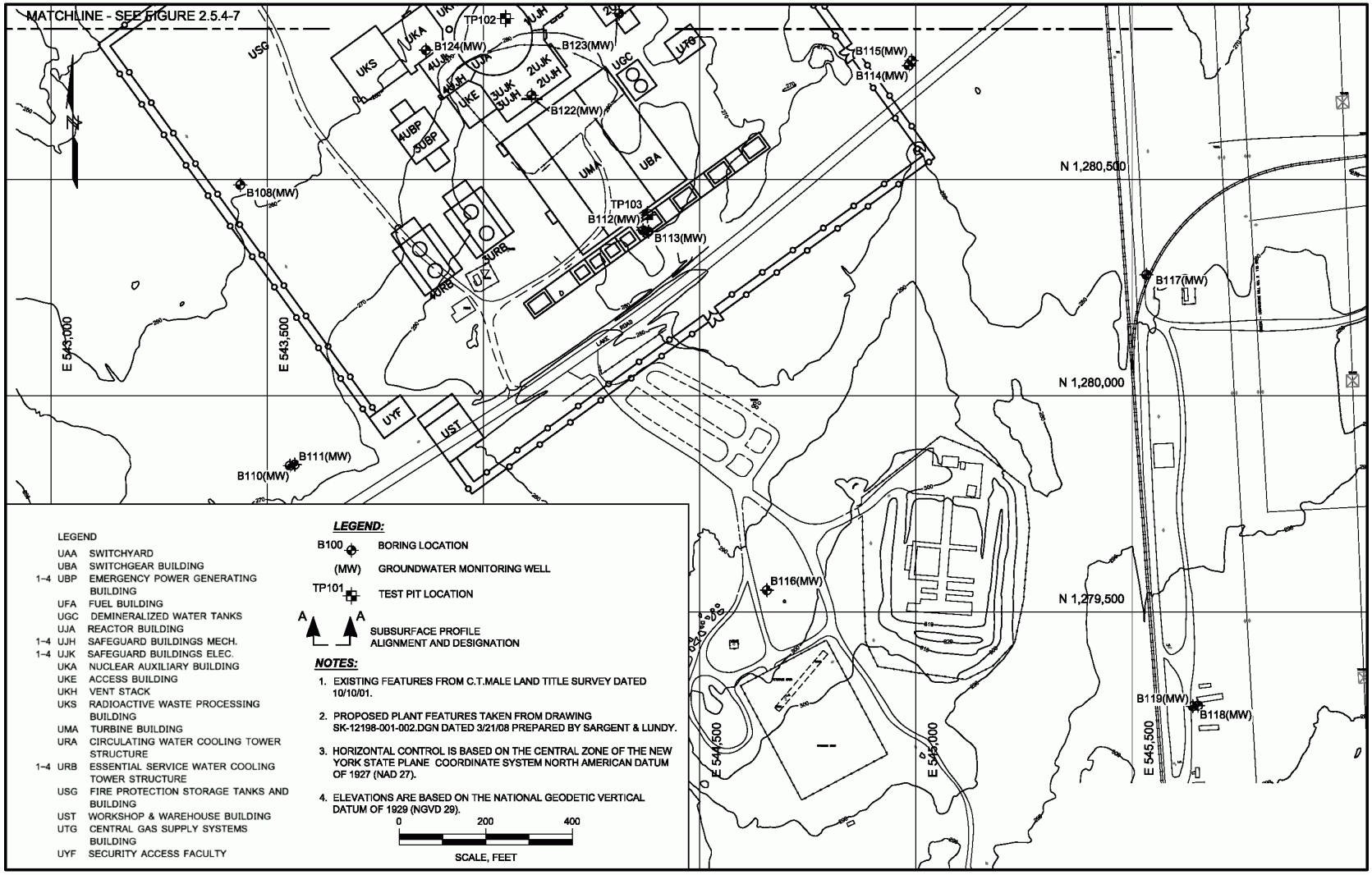


Figure 2.5-61—{Exploration Plan 100 and 300 Series Borings (South)}



LEGEND

	UAA	SWITCHYARD
	UBA	SWITCHGEAR BUILDING
1–4	UBP	EMERGENCY POWER GENERATING BUILDING
	UFA	FUEL BUILDING
	UGC	DEMINERALIZED WATER TANKS
	UJA	REACTOR BUILDING
1–4	UJH	SAFEGUARD BUILDINGS MECH.
1–4	UJK	SAFEGUARD BUILDINGS ELEC.
	UKA	NUCLEAR AUXILIARY BUILDING
	UKE	ACCESS BUILDING
	UKH	VENT STACK
	UKS	RADIOACTIVE WASTE PROCESSING BUILDING
	UMA	TURBINE BUILDING
	URA	CIRCULATING WATER COOLING TOWER STRUCTURE
1–4	URB	ESSENTIAL SERVICE WATER COOLING TOWER STRUCTURE
	USG	FIRE PROTECTION STORAGE TANKS AND BUILDING
	UST	WORKSHOP & WAREHOUSE BUILDING
	UTG	CENTRAL GAS SUPPLY SYSTEMS BUILDING
	UYF	SECURITY ACCESS FACULTY

LEGEND:

B100 ⊕	BORING LOCATION
(MW)	GROUNDWATER MONITORING WELL
TP101 ⊞	TEST PIT LOCATION
A ▲ ▲ A	SUBSURFACE PROFILE ALIGNMENT AND DESIGNATION

NOTES:

1. EXISTING FEATURES FROM C.T.MALE LAND TITLE SURVEY DATED 10/10/01.
2. PROPOSED PLANT FEATURES TAKEN FROM DRAWING SK-12198-001-002.DGN DATED 3/21/08 PREPARED BY SARGENT & LUNDY.
3. HORIZONTAL CONTROL IS BASED ON THE CENTRAL ZONE OF THE NEW YORK STATE PLANE COORDINATE SYSTEM NORTH AMERICAN DATUM OF 1927 (NAD 27).
4. ELEVATIONS ARE BASED ON THE NATIONAL GEODETIC VERTICAL DATUM OF 1929 (NGVD 29).

Figure 2.5-62—{Exploration Plan 200 Series Borings}

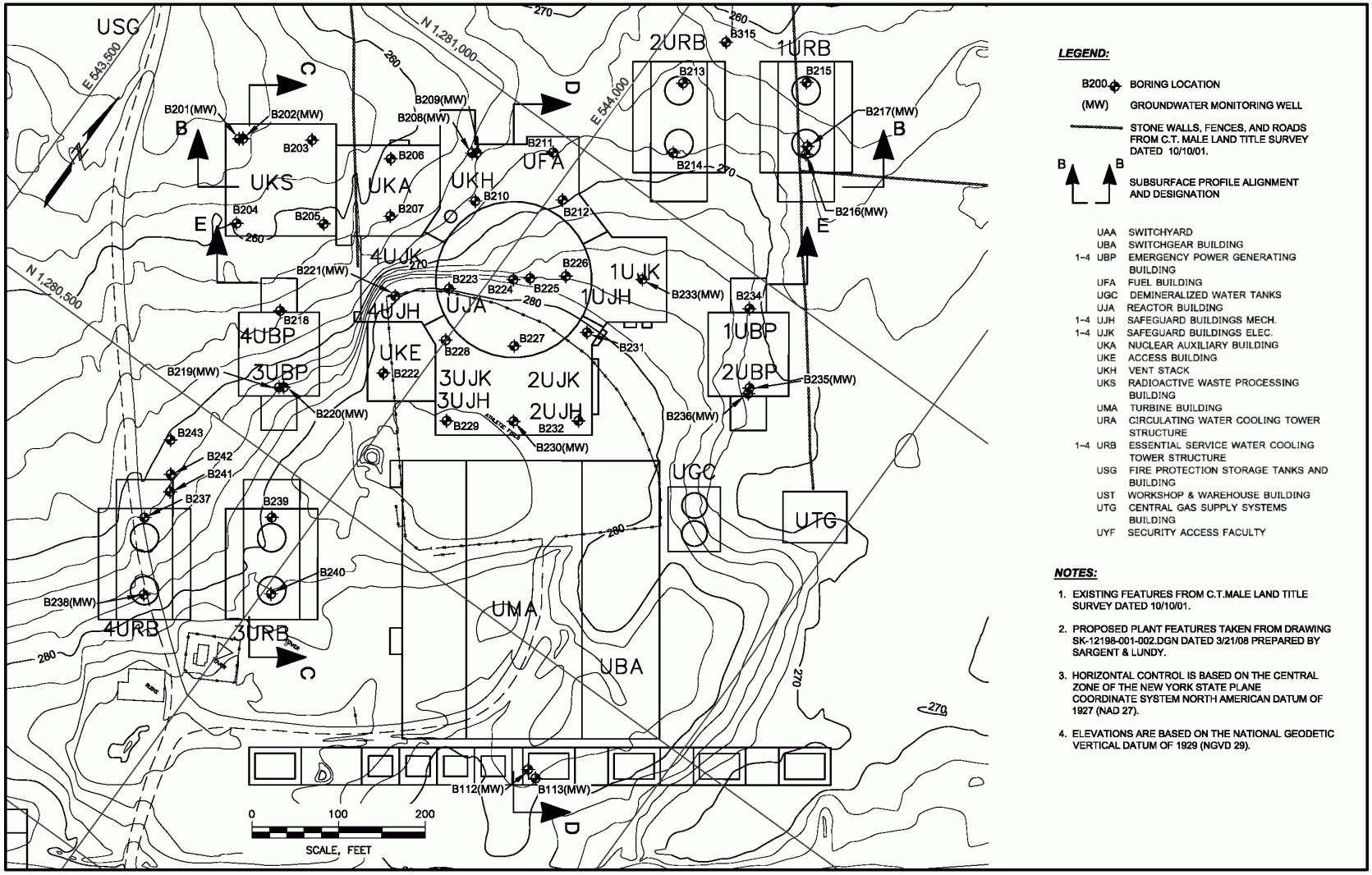


Figure 2.5-63—{Subsurface Profile A-A}

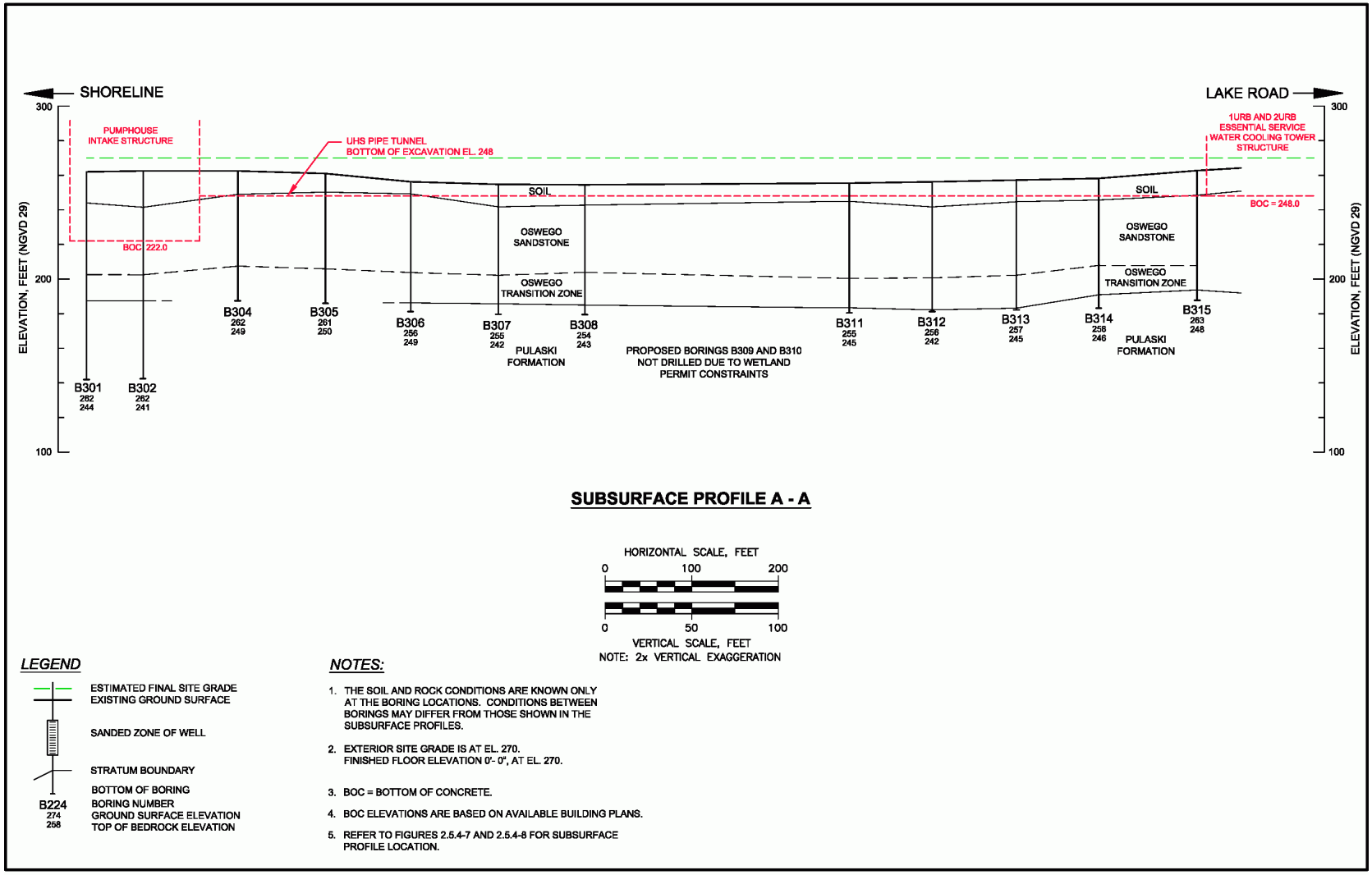


Figure 2.5-64—{Subsurface Profile B-B}

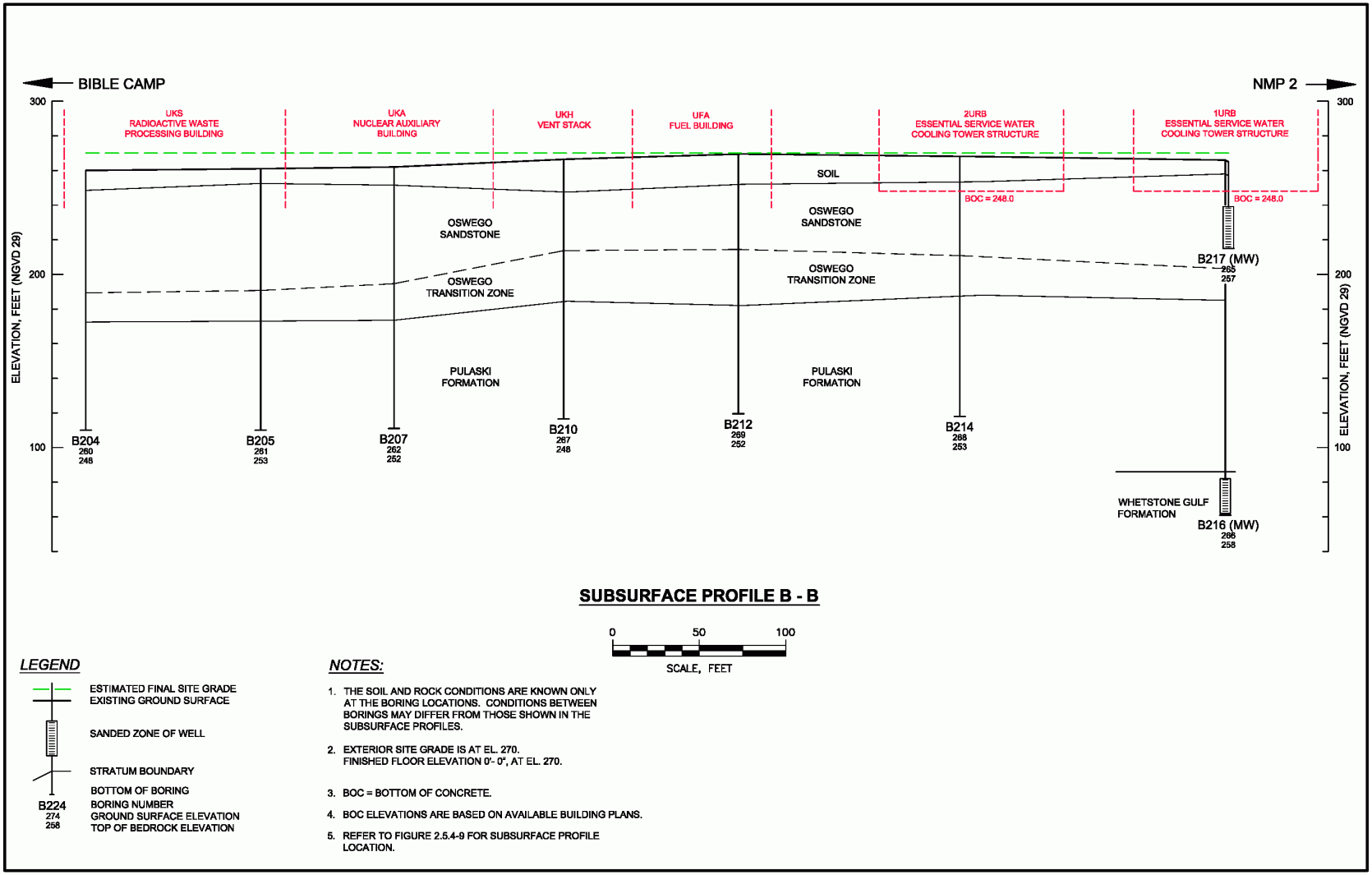


Figure 2.5-65—{Subsurface Profile C-C}

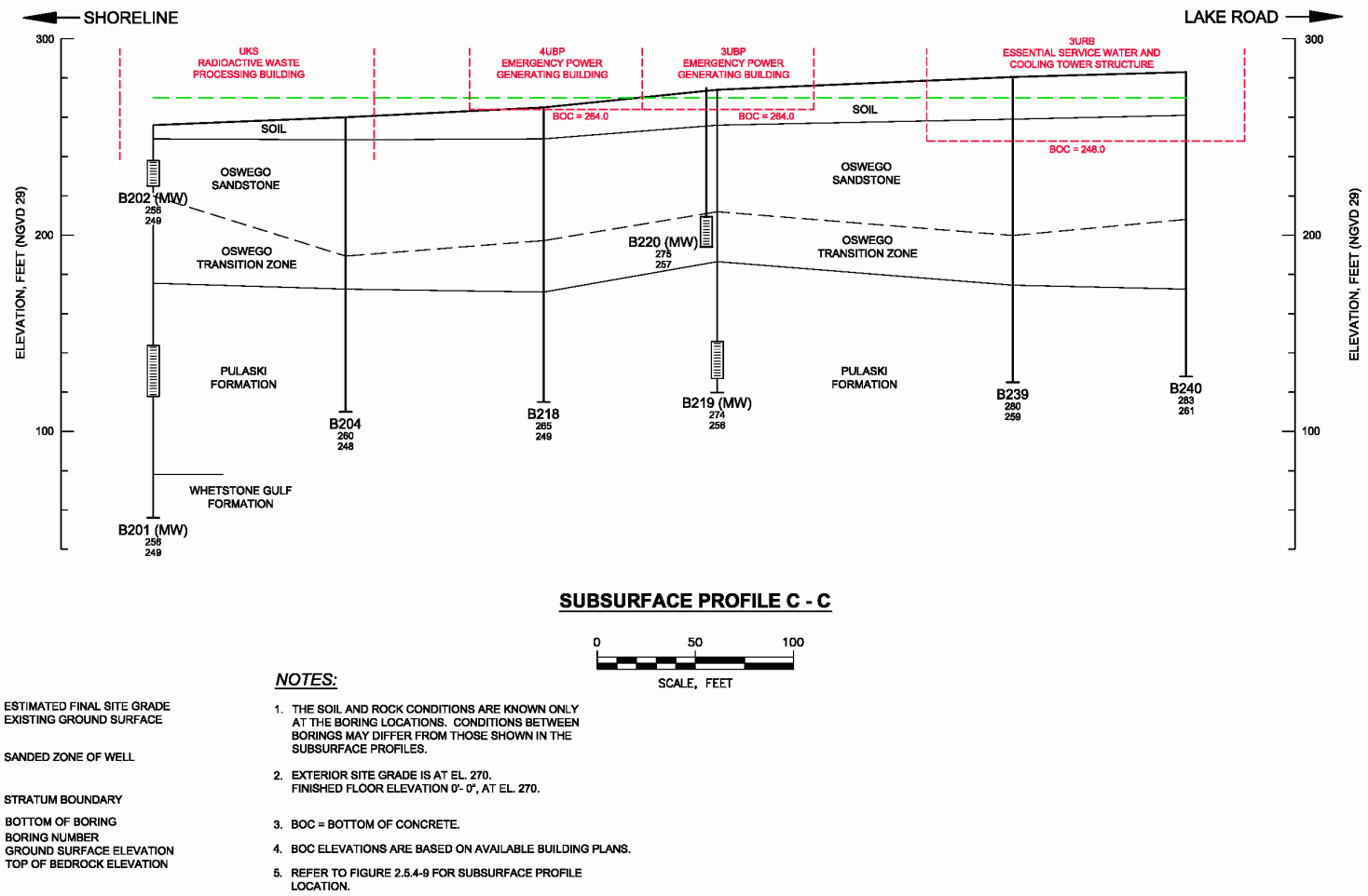
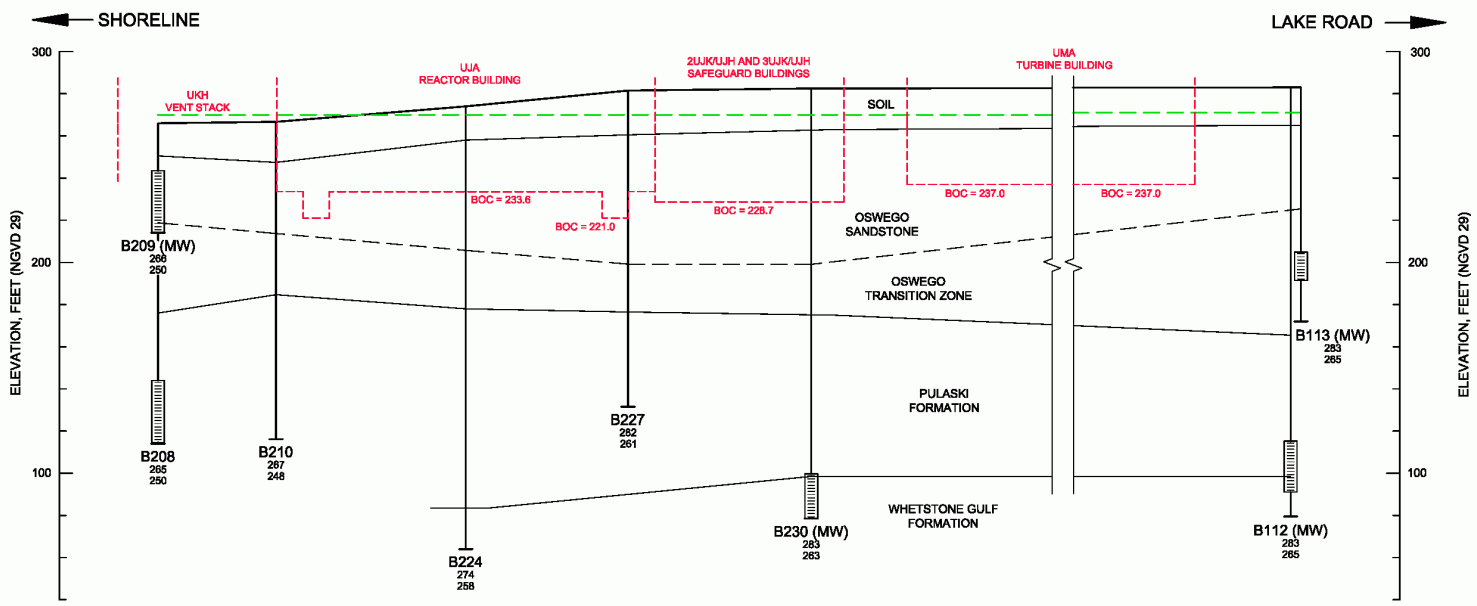


Figure 2.5-66—{Subsurface Profile D-D}



SUBSURFACE PROFILE D - D

0 50 100
SCALE, FEET

LEGEND

- ESTIMATED FINAL SITE GRADE
- EXISTING GROUND SURFACE
- SANDED ZONE OF WELL
- STRATUM BOUNDARY
- BOTTOM OF BORING
- B224 — BORING NUMBER
- 274 — GROUND SURFACE ELEVATION
- 258 — TOP OF BEDROCK ELEVATION

NOTES:

1. THE SOIL AND ROCK CONDITIONS ARE KNOWN ONLY AT THE BORING LOCATIONS. CONDITIONS BETWEEN BORINGS MAY DIFFER FROM THOSE SHOWN IN THE SUBSURFACE PROFILES.
2. EXTERIOR SITE GRADE IS AT EL. 270. FINISHED FLOOR ELEVATION 0'- 0", AT EL. 270.
3. BOC = BOTTOM OF CONCRETE.
4. BOC ELEVATIONS ARE BASED ON AVAILABLE BUILDING PLANS.
5. REFER TO FIGURE 2.5.4-9 FOR SUBSURFACE PROFILE LOCATION.

Figure 2.5-67—{Subsurface Profile E-E}

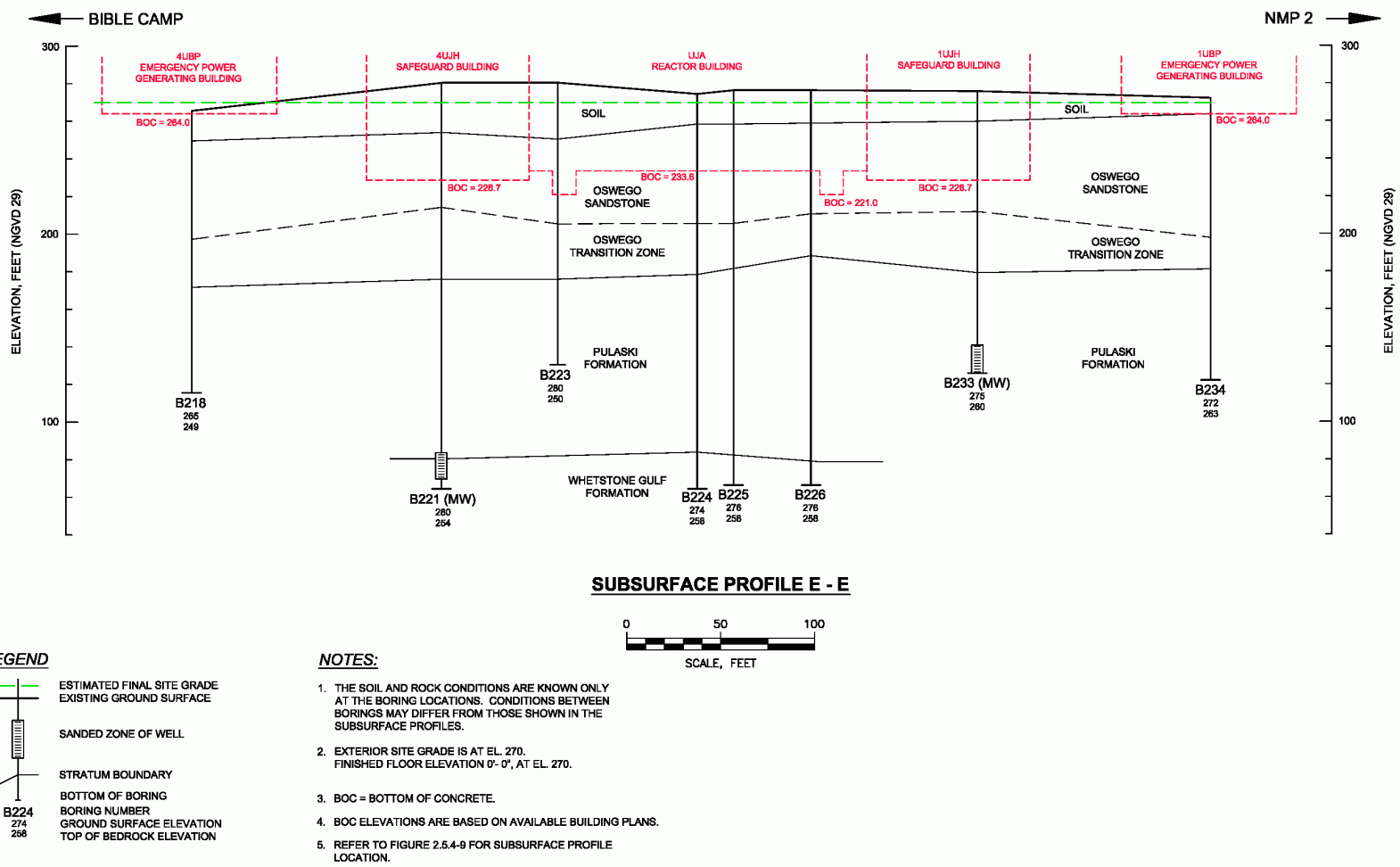
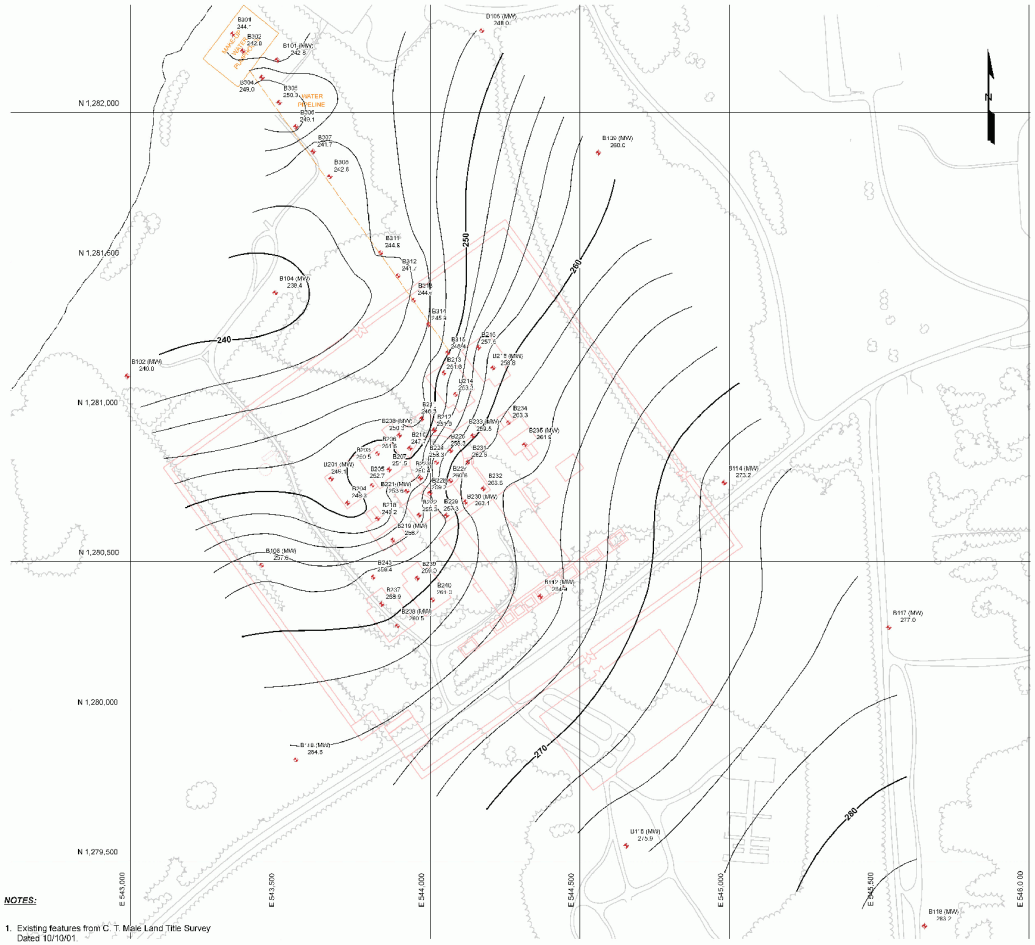


Figure 2.5-68—{Top of Oswego Sandstone Contours}



Number	Boring Number	NORTHING	EASTING	Top of Oswego Sandstone (Feet)
1	B101 (MW)	1282173.9	543489.0	242.8
2	B102 (MW)	1281119.1	542988.4	240.0
3	B104 (MW)	1281396.8	543483.1	238.4
4	B106 (MW)	1282272.9	544173.3	248.0
5	B108 (MW)	1280487.7	543437.5	257.6
6	B109 (MW)	1281884.9	544562.3	260.0
7	B110 (MW)	1279838.6	543552.2	264.6
8	B112 (MW)	1280362.8	544368.5	264.9
9	B114 (MW)	1280763.3	544983.0	273.2
10	B116 (MW)	1279550.8	544655.3	275.9
11	B117 (MW)	1280280.0	545532.7	277.0
12	B118 (MW)	1279283.8	545652.1	283.2
13	B201 (MW)	1280776.2	543669.7	249.1
14	B203	1280824.6	543738.8	250.5
15	B204	1280695.3	543724.7	246.3
16	B205	1280754.1	543806.7	252.7
17	B206	1280860.5	543825.2	251.6
18	B207	1280806.6	543863.7	251.5
19	B208 (MW)	1280921.3	543897.4	250.3
20	B210	1280878.4	543932.8	247.7
21	B211	1280976.9	543972.8	246.3
22	B212	1280938.8	544013.9	251.9
23	B213	1281129.8	544047.2	251.6
24	B214	1281058.0	544085.3	253.3
25	B215	1281214.5	544162.3	257.5
26	B216 (MW)	1281146.8	544210.4	258.8
27	B218	1280643.2	543825.0	249.2
28	B219 (MW)	1280570.9	543875.9	256.4
29	B221 (MW)	1280735.3	543922.7	253.6
30	B222	1280655.1	543963.9	255.3
31	B223	1280778.6	543968.0	250.4
32	B224	1280831.1	544021.9	256.3
33	B226	1280869.8	544068.6	258.3
34	B227	1280769.4	544067.8	260.6
35	B228	1280728.2	543999.7	259.2
36	B229	1280663.5	544055.4	257.3
37	B230 (MW)	1280998.5	544118.4	263.1
38	B231	1280831.5	544126.6	262.6
39	B232	1280743.1	544178.7	263.6
40	B233 (MW)	1280918.8	544142.4	259.5
41	B234	1280964.0	544262.5	263.3
42	B235 (MW)	1280889.9	544316.3	261.9
43	B237	1280357.7	543838.5	258.9
44	B238 (MW)	1280285.2	543890.3	260.5
45	B239	1280444.2	543957.5	259.0
46	B240	1280372.3	544008.8	261.0
47	B243	1280448.1	543810.1	259.4
48	B301	1282261.0	543340.8	244.1
49	B302	1282204.9	543374.5	242.0
50	B304	1282115.9	543438.4	249.0
51	B305	1282032.5	543496.0	250.3
52	B306	1281951.5	543551.8	249.1
53	B307	1281868.2	543609.7	241.7
54	B308	1281785.2	543665.4	242.8
55	B311	1281531.2	543835.6	244.9
56	B312	1281454.1	543892.3	241.7
57	B313	1281372.8	543946.0	244.7
58	B314	1281291.5	543995.6	245.9
59	B315	1281197.5	544059.5	248.4

LEGEND

B100 Boring Location

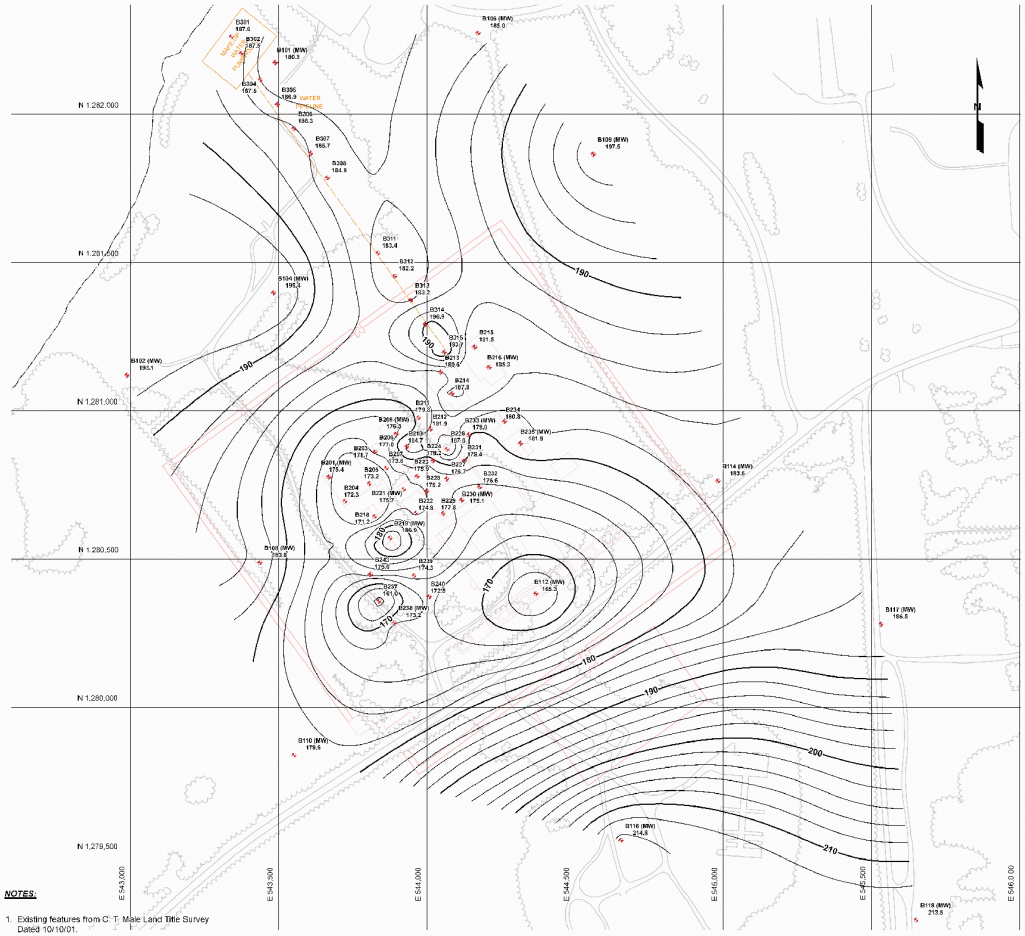
Proposed Plant

Top of Oswego Sandstone Elevation Contours - Interval: 2 Feet

NOTES:

1. Existing features from C. T. Male Land Title Survey Dated 10/10/01.
2. Proposed Plant features taken from drawing SK-12198-001-002.dgn dated 3/21/08 prepared by Sargent & Lundy.
3. Horizontal control is based on the Central Zone of the New York State Plane Coordinate System North American Datum of 1927 (NAD 27).
4. Elevations are based on the National Geodetic Vertical Datum of 1929 (NGVD 29).

Figure 2.5-69—{Top of Pulaski A Contours}



Number	Boring Number	NORTHING	EASTING	Top of Pulaski Elevation (Feet)
1	B101 (MW)	1282173.9	543489.0	180.3
2	B102 (MW)	1281119.1	542988.4	193.1
3	B104 (MW)	1281396.9	543483.1	195.4
4	B106 (MW)	1282272.9	544173.3	185.0
5	B108 (MW)	1280487.7	543437.5	183.8
6	B109 (MW)	1281864.9	544562.3	197.5
7	B110 (MW)	1279838.6	543552.2	179.6
8	B112 (MW)	1280382.8	544368.5	185.3
9	B114 (MW)	1280763.3	544983.0	183.5
10	B116 (MW)	1279550.8	544655.3	214.8
11	B117 (MW)	1280280.0	545532.7	186.5
12	B118 (MW)	1279283.8	545662.1	213.5
13	B201 (MW)	1280776.2	543669.7	175.4
14	B203	1280824.6	543738.8	171.7
15	B204	1280695.3	543724.7	172.3
16	B205	1280754.1	543806.7	173.2
17	B206	1280860.5	543825.2	177.0
18	B207	1280806.6	543863.7	173.6
19	B208 (MW)	1280921.3	543897.4	176.3
20	B210	1280878.4	543932.8	184.7
21	B211	1280976.9	543977.8	179.8
22	B212	1280938.8	544013.9	181.9
23	B213	1281129.8	544047.2	180.6
24	B214	1281058.0	544085.3	187.8
25	B215	1281214.5	544162.3	181.5
26	B216 (MW)	1281146.8	544210.4	185.3
27	B218	1280643.2	543825.0	171.2
28	B219 (MW)	1280570.9	543875.9	186.9
29	B221 (MW)	1280735.3	543922.7	175.7
30	B222	1280655.1	543963.9	174.8
31	B223	1280778.6	543968.0	175.9
32	B224	1280831.1	544021.9	178.2
33	B225	1280869.8	544068.6	187.8
34	B227	1280769.4	544067.8	176.7
35	B228	1280728.2	543999.7	176.2
36	B229	1280653.5	544055.4	177.8
37	B230 (MW)	1280698.5	544118.4	175.1
38	B231	1280831.5	544126.6	179.4
39	B232	1280743.1	544178.7	175.6
40	B233 (MW)	1280918.8	544142.4	179.0
41	B234	1280964.0	544262.5	180.8
42	B235 (MW)	1280889.9	544316.3	181.9
43	B237	1280357.7	543838.5	161.0
44	B238 (MW)	1280285.2	543890.3	173.2
45	B239	1280444.2	543957.5	174.3
46	B240	1280372.3	544008.8	172.5
47	B243	1280446.1	543810.1	175.0
48	B301	1282261.0	543340.8	187.6
49	B302	1282204.9	543374.5	187.5
50	B304	1282115.9	543438.4	187.5
51	B305	1282032.5	543496.0	186.9
52	B306	1281951.5	543551.8	186.3
53	B307	1281868.2	543609.7	185.7
54	B308	1281785.2	543665.4	184.9
55	B311	1281531.2	543835.6	183.4
56	B312	1281454.1	543892.3	182.2
57	B313	1281372.8	543946.0	183.2
58	B314	1281291.5	543995.6	190.9
59	B315	1281197.5	544059.5	193.7

LEGEND

B100 Boring Location

Proposed Plant

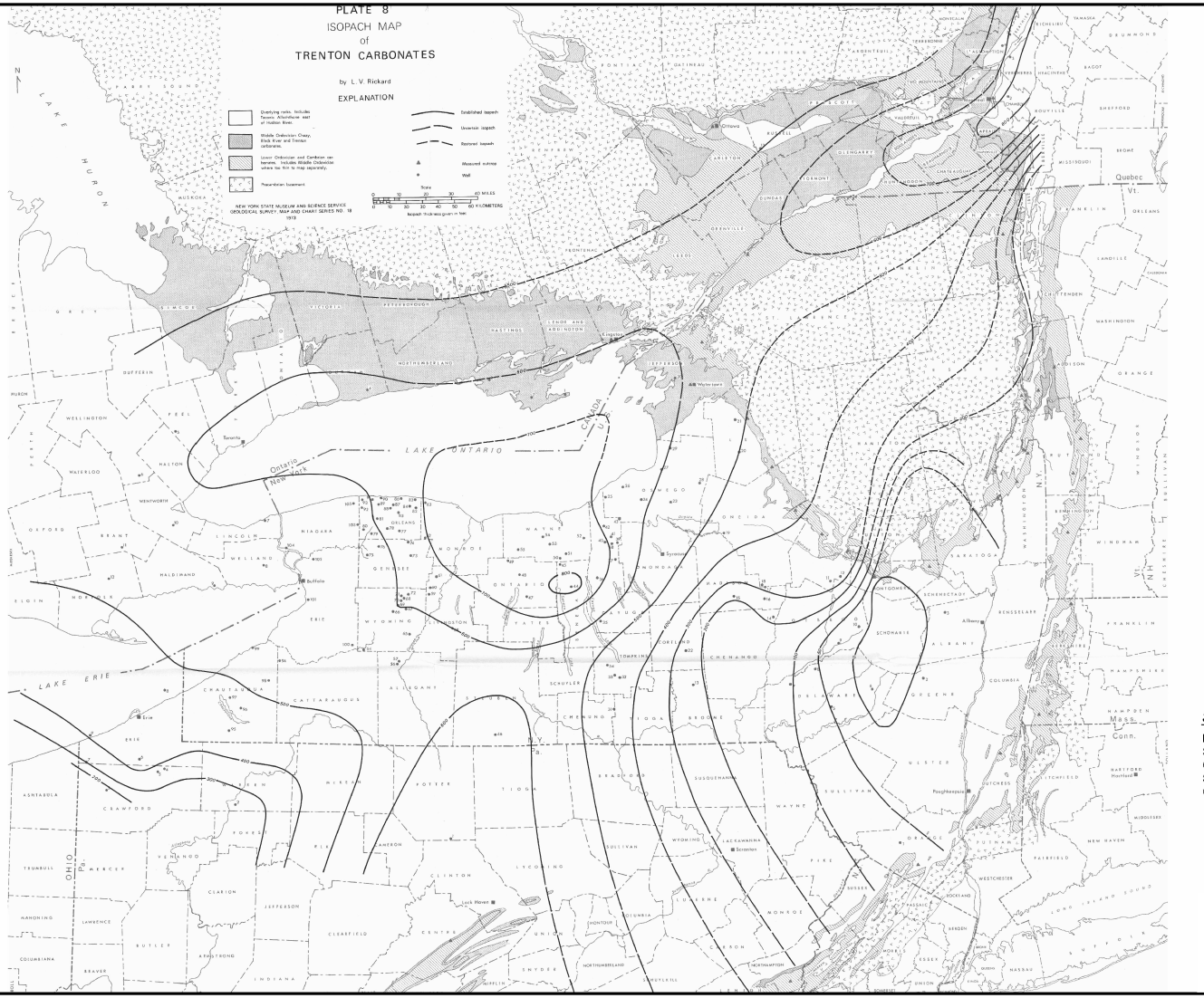
Pulaski A Elevation Contours - Interval: 2 Feet

NOTES:

1. Existing features from C. T. Male Land Title Survey Dated 10/10/01.
2. Proposed Plant features taken from drawing SK-12198-001-002.dgn dated 3/21/08 prepared by Sargent & Lundy.
3. Horizontal control is based on the Central Zone of the New York State Plane Coordinate System North American Datum of 1927 (NAD 27).
4. Elevations are based on the National Geodetic Vertical Datum of 1929 (NGVD 29).

0 200 400 Feet

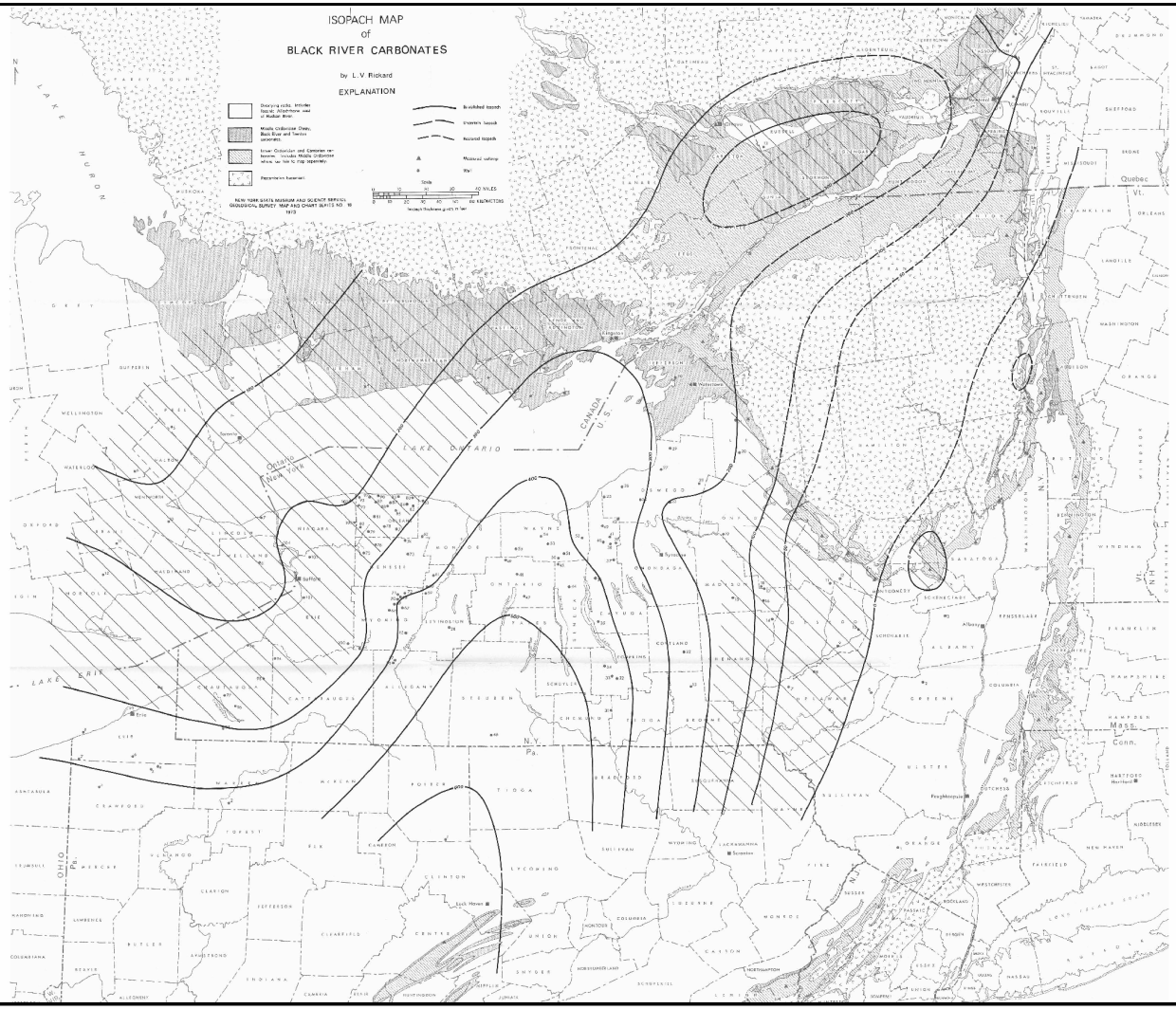
Figure 2.5-70—{Plate 8 - Isopach Map of Trenton Carbonates}



SOURCE:

LAWRENCE V. RICKARD, 1973, "STRATIGRAPHY AND STRUCTURE OF THE SUBSURFACE CAMBRIAN AND ORDOVICIAN CARBONATES OF NEW YORK" NEW YORK STATE MUSEUM AND SCIENCE SERVICE, MAP AND CHART SERIES NUMBER 18.

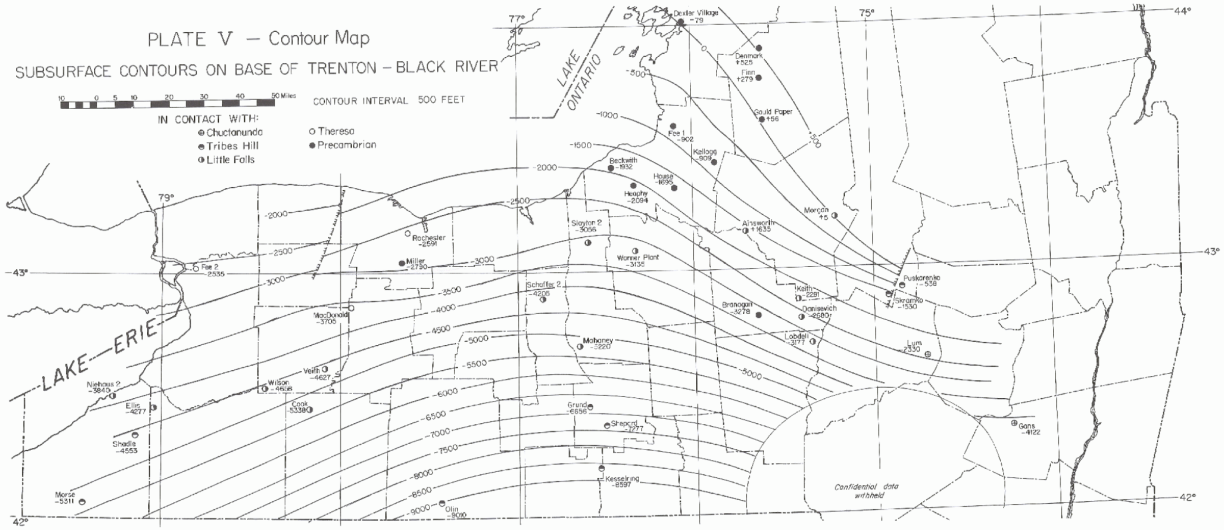
Figure 2.5-71—{Plate 7 - Isopach Map of Black River Carbonates}



SOURCE:

LAWRENCE V. RICKARD, 1973, "STRATIGRAPHY AND STRUCTURE OF THE SUBSURFACE CAMBRIAN AND ORDOVICIAN CARBONATES OF NEW YORK" NEW YORK STATE MUSEUM AND SCIENCE SERVICE, MAP AND CHART SERIES NUMBER 18.

Figure 2.5-72—{Plate 5 - Contour Map Subsurface Contours on Base of Trenton - Black River}



SOURCE:

CHARLES W. FLAGLER, 1966, "SUBSURFACE CAMBRIAN AND ORDOVICIAN STRATIGRAPHY OF THE TRENTON GROUP-PRECAMBRIAN INTERVAL IN NEW YORK STATE" MAP AND CHART SERIES NO. 8, NEW YORK STATE MUSEUM AND SCIENCE SERVICE.

Figure 2.5-73—{NMP Unit 1 and Unit 2 Site Geologic Structures}

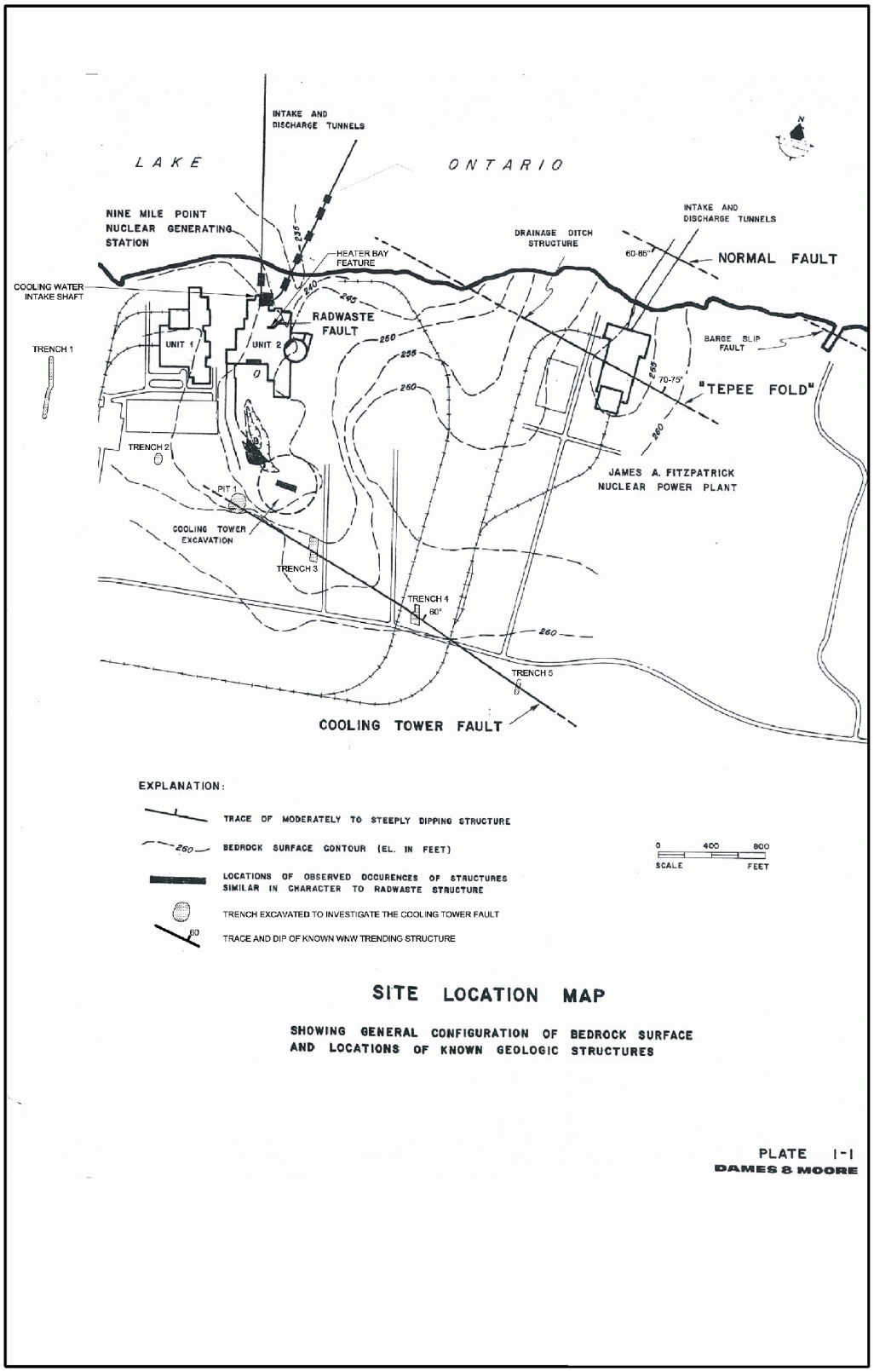


Figure 2.5-74—{Historical Seismicity in Vicinity of NMPS Site (shown with a star) from EPRI Catalog and from Additional Catalogs (1985-2007)}

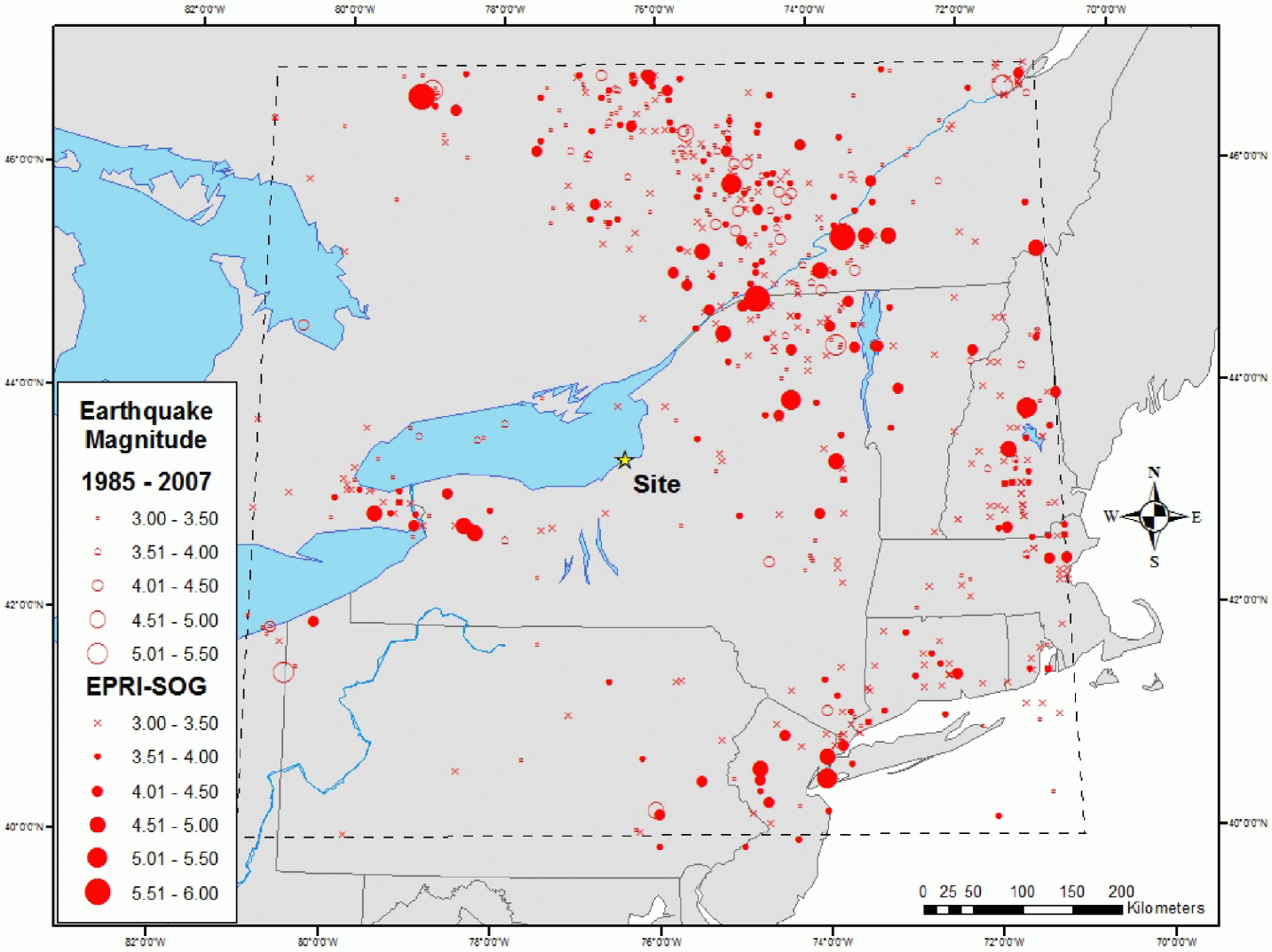


Figure 2.5-75—{Historical Seismicity Close to NMPS Site (shown with a star) from EPRI Catalog and from Additional Catalogs (1985-2007)}

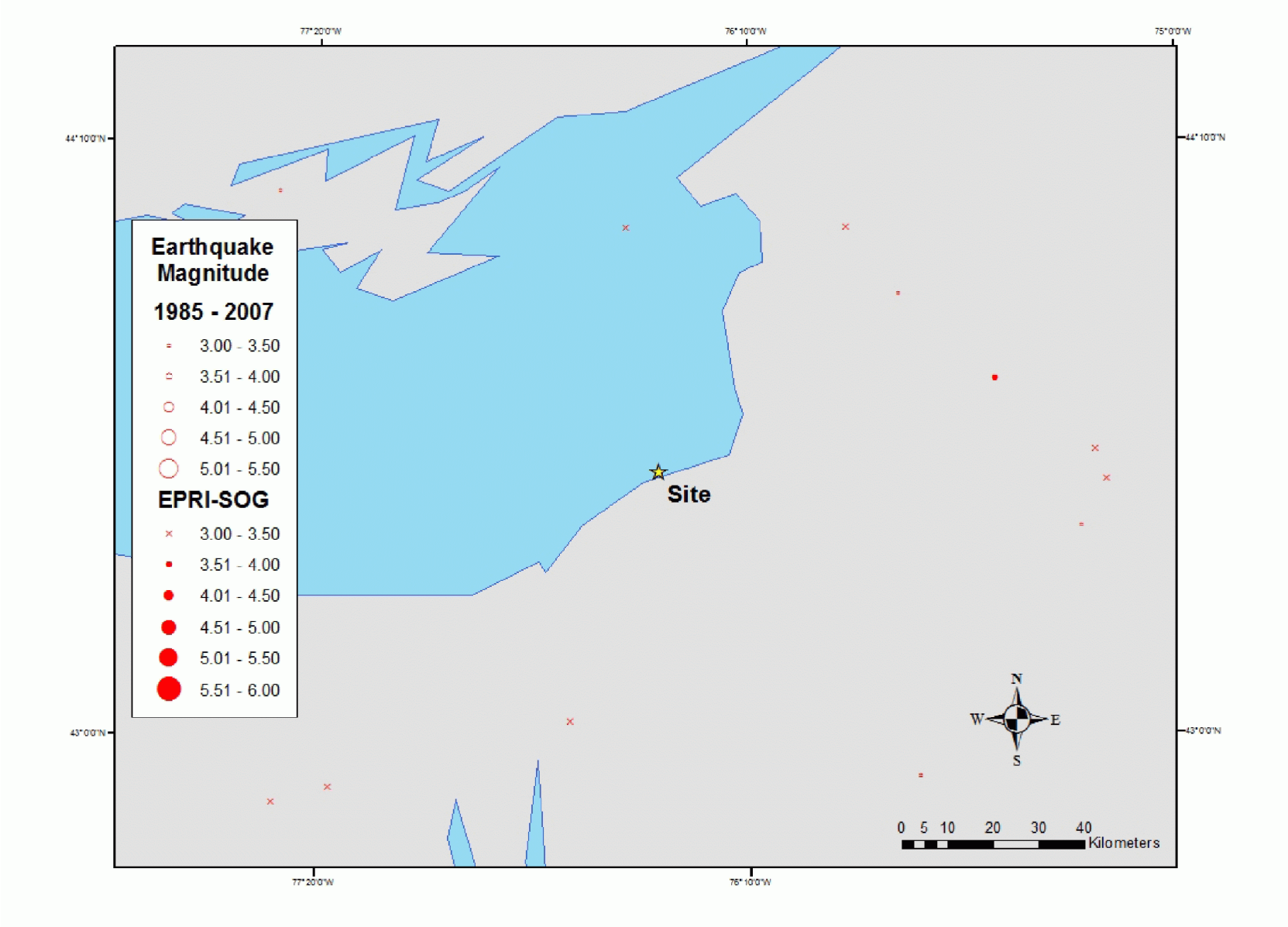


Figure 2.5-76—{Historical Seismicity in Charlevoix Seismic Zone (with NMPS site shown as a star) from EPRI Catalog (through 1984) and from Additional Catalogs (1985-2007)}

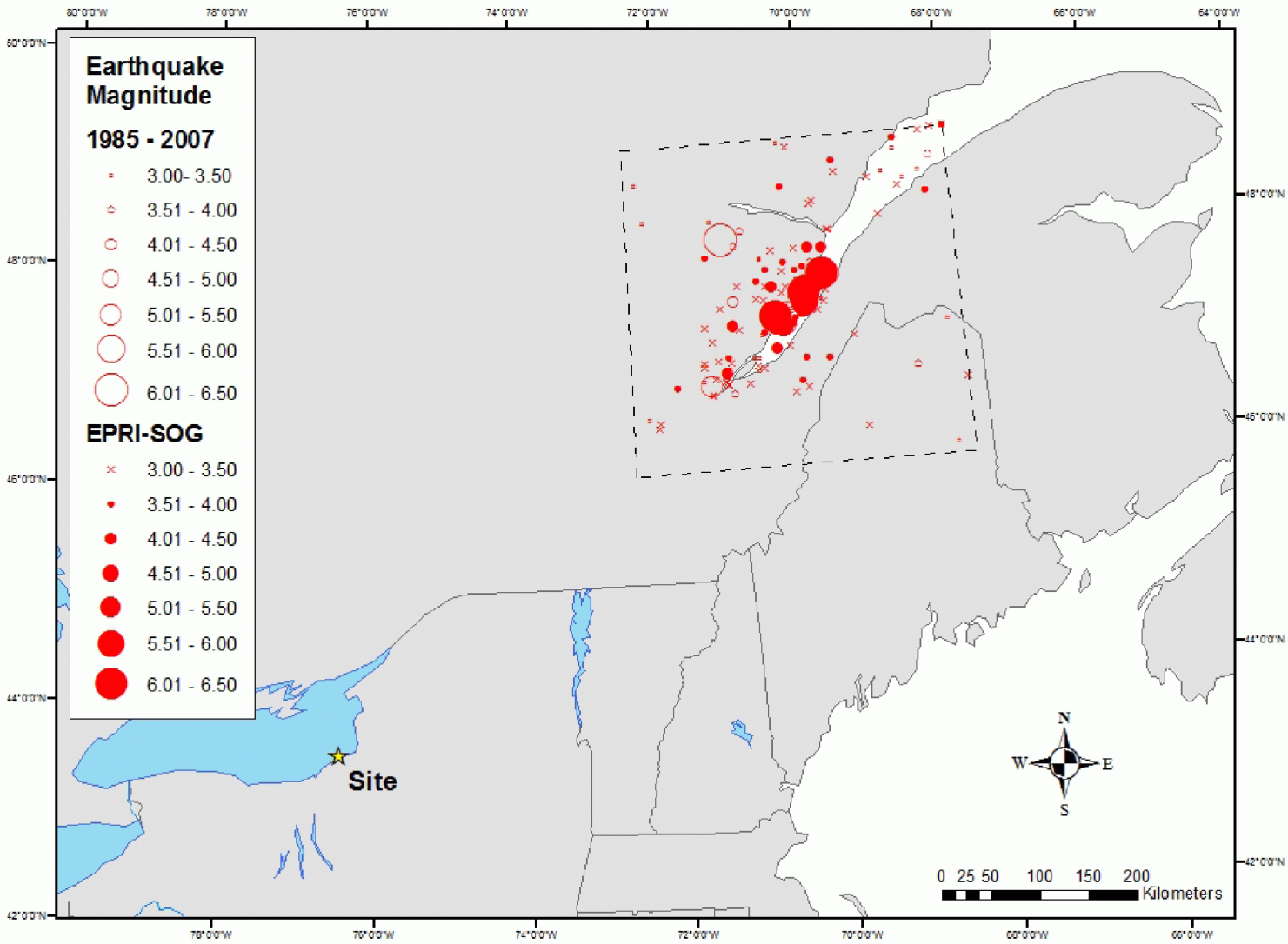


Figure 2.5-77—{Bechtel Seismic Source Zones and EPRI-SOG pre-1985 Catalog}

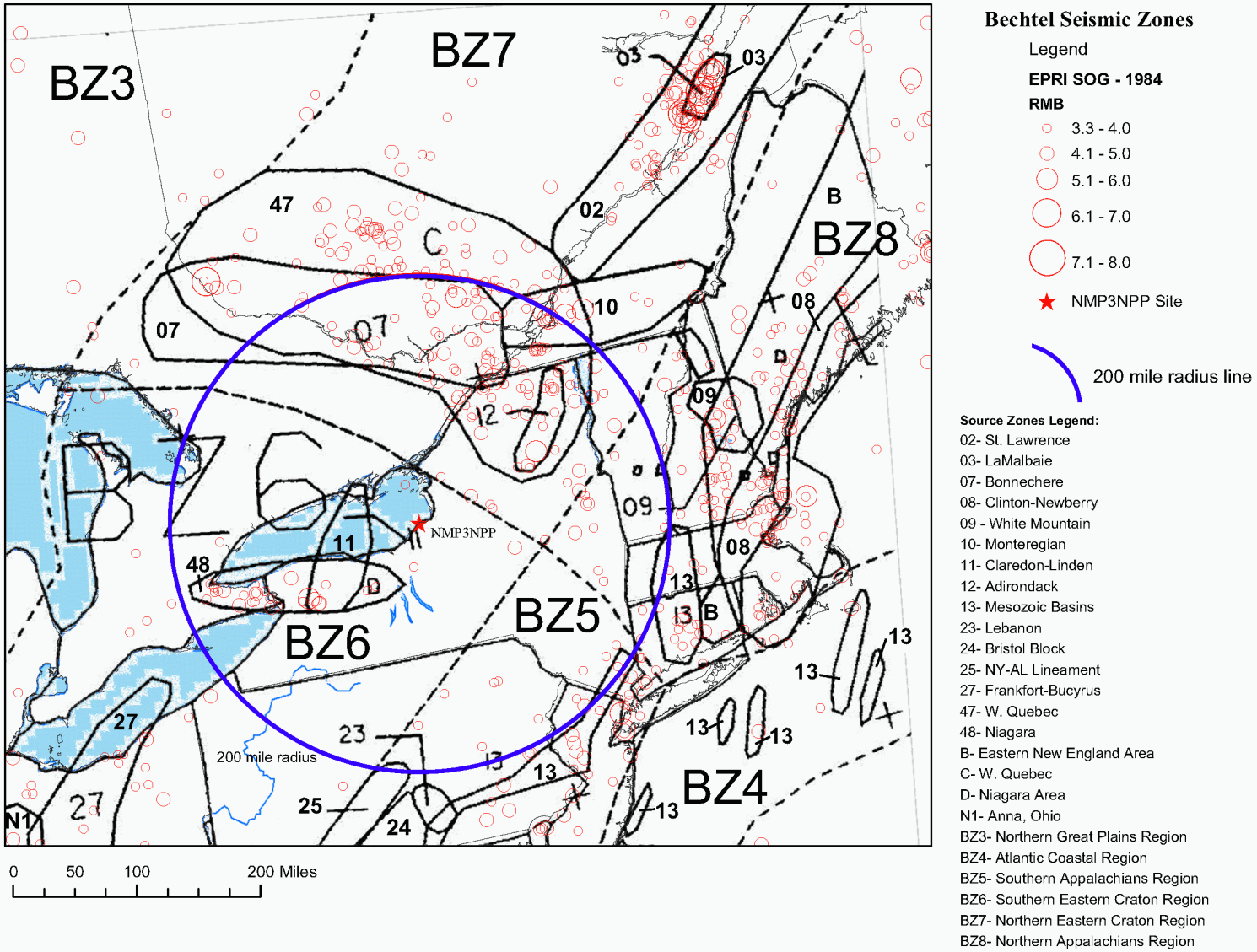


Figure 2.5-78—{Bechtel Seismic Source Zones and 1985-2007 Catalog Update}

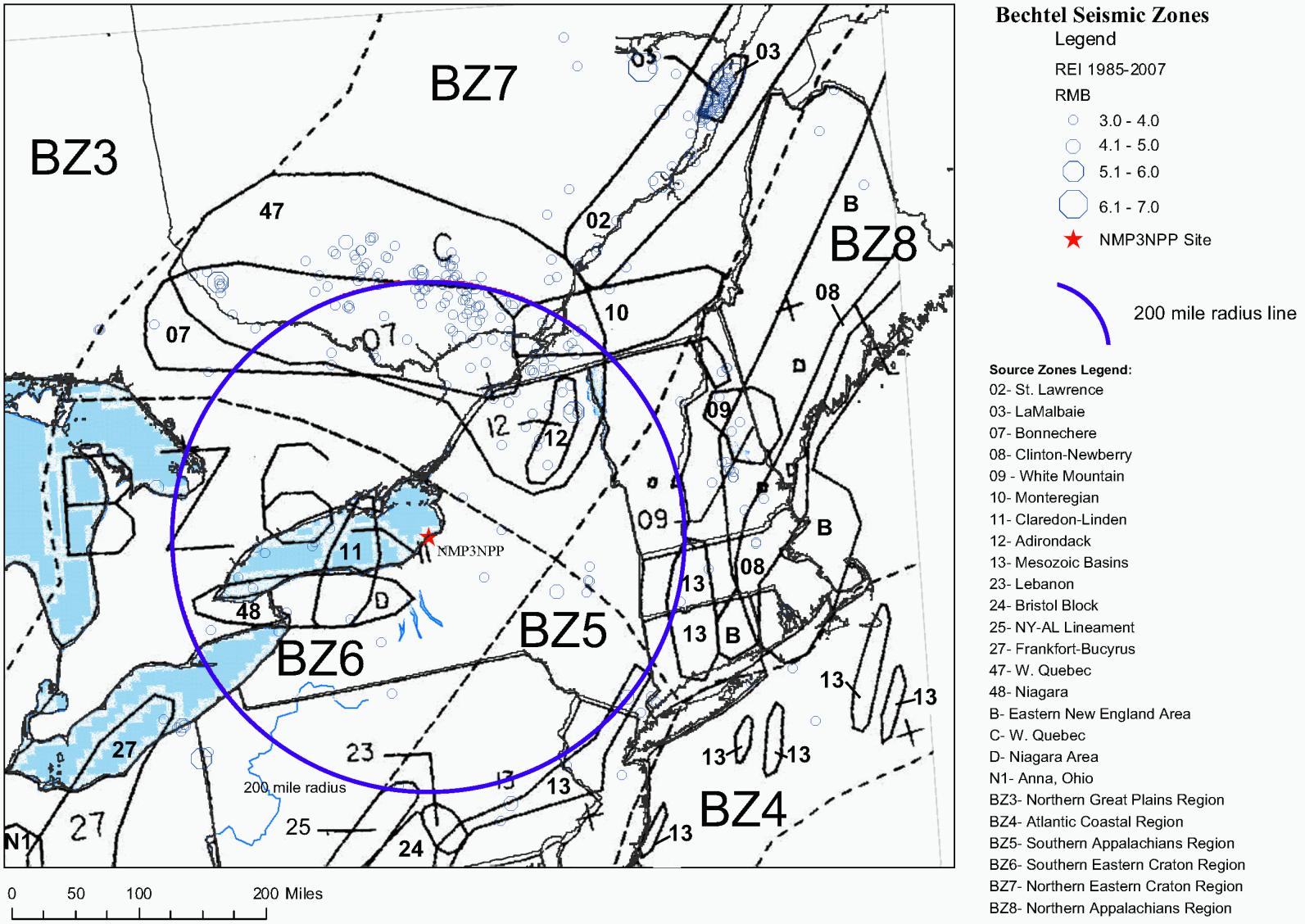


Figure 2.5-79—{Dames & Moore Seismic Source Zones and EPRI-SOG pre-1985 Catalog}

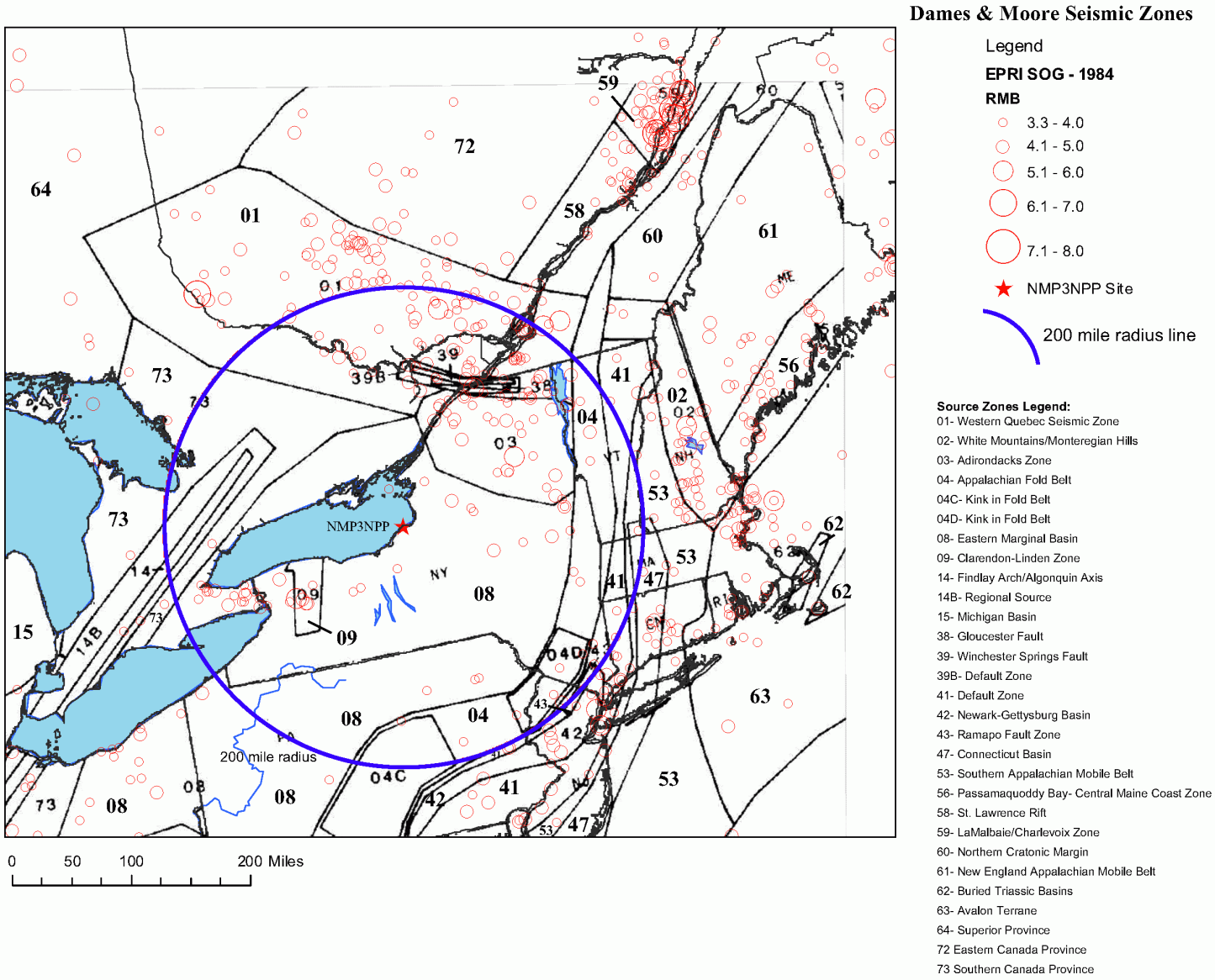


Figure 2.5-80—{Dames & Moore Seismic Source Zones and 1985-2007 Catalog Update}

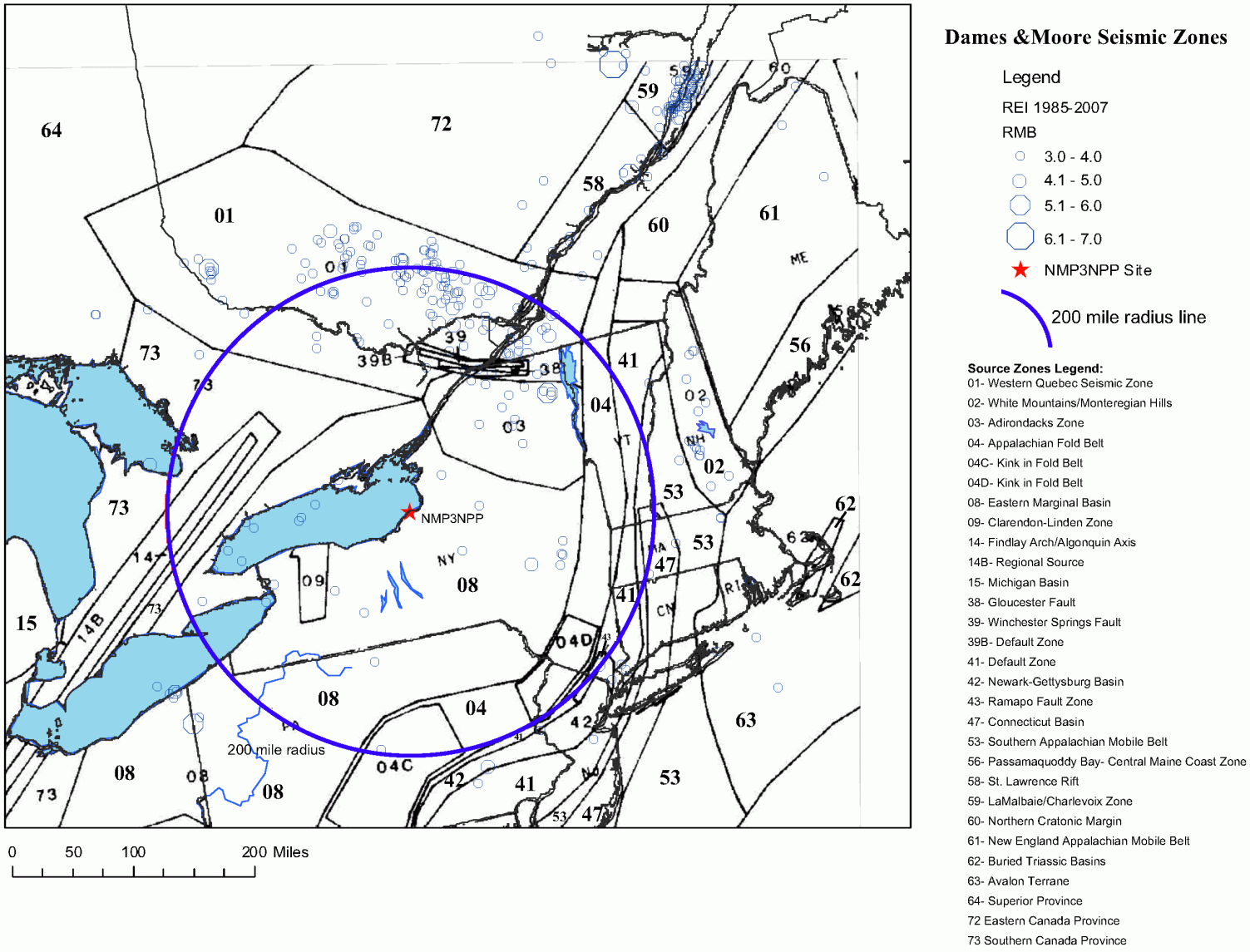


Figure 2.5-81—{Law Engineering Seismic Source Zones and EPRI-SOG pre-1985 Catalog}

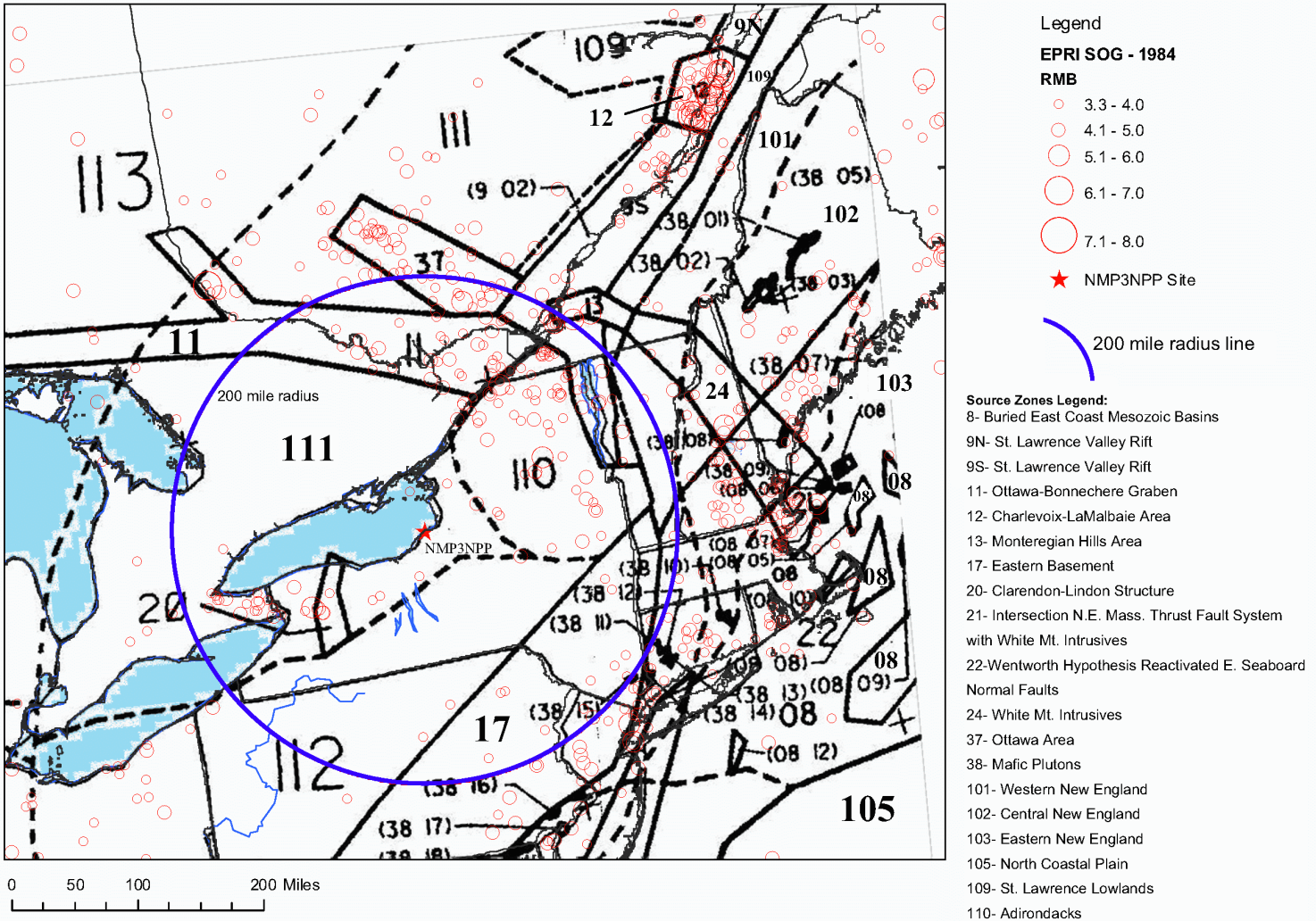


Figure 2.5-82—{Law Engineering Seismic Source Zones and 1985-2007 Catalog Update}

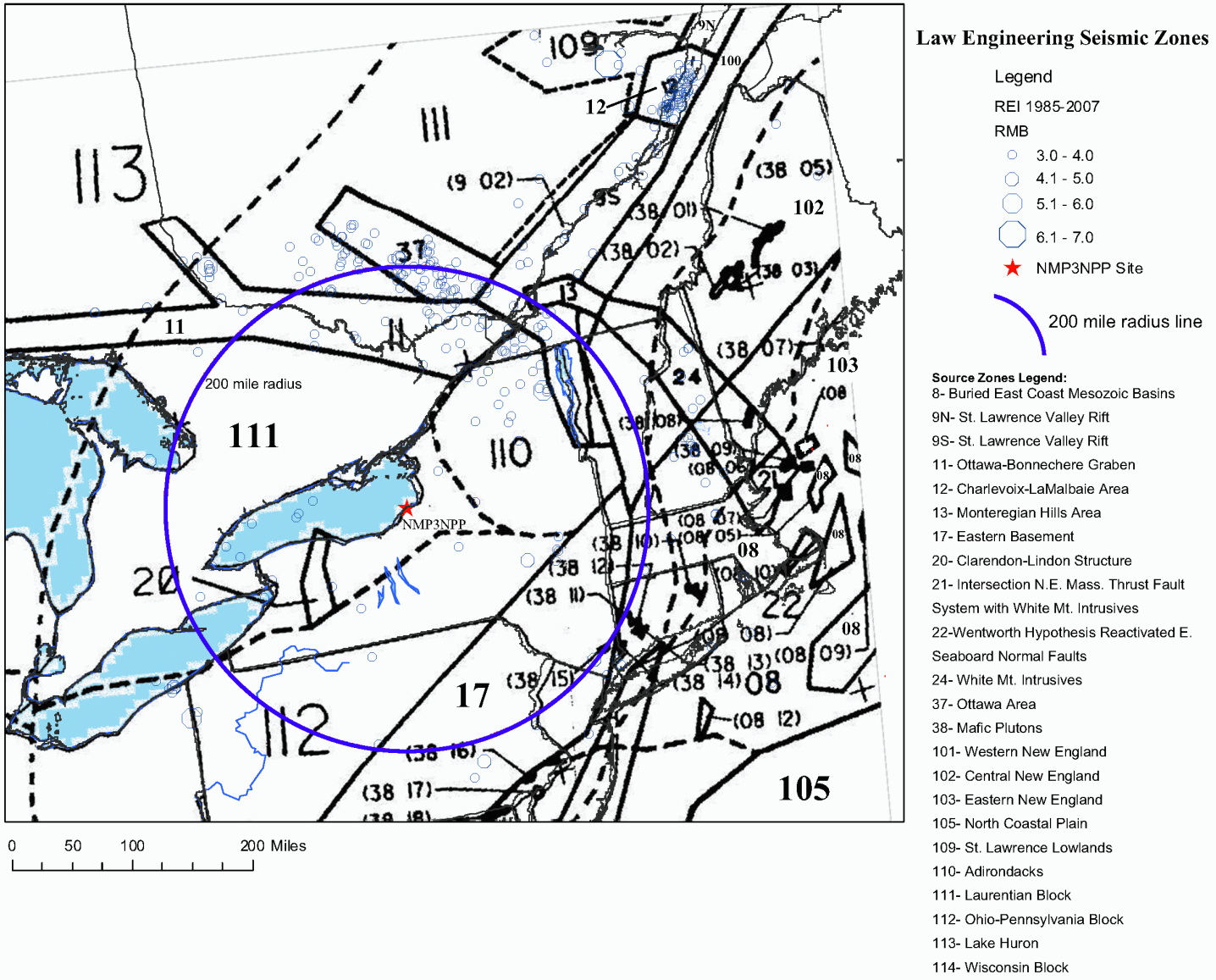


Figure 2.5-83—{Rondout Seismic Source Zones and EPRI-SOG pre-1985 Catalog}

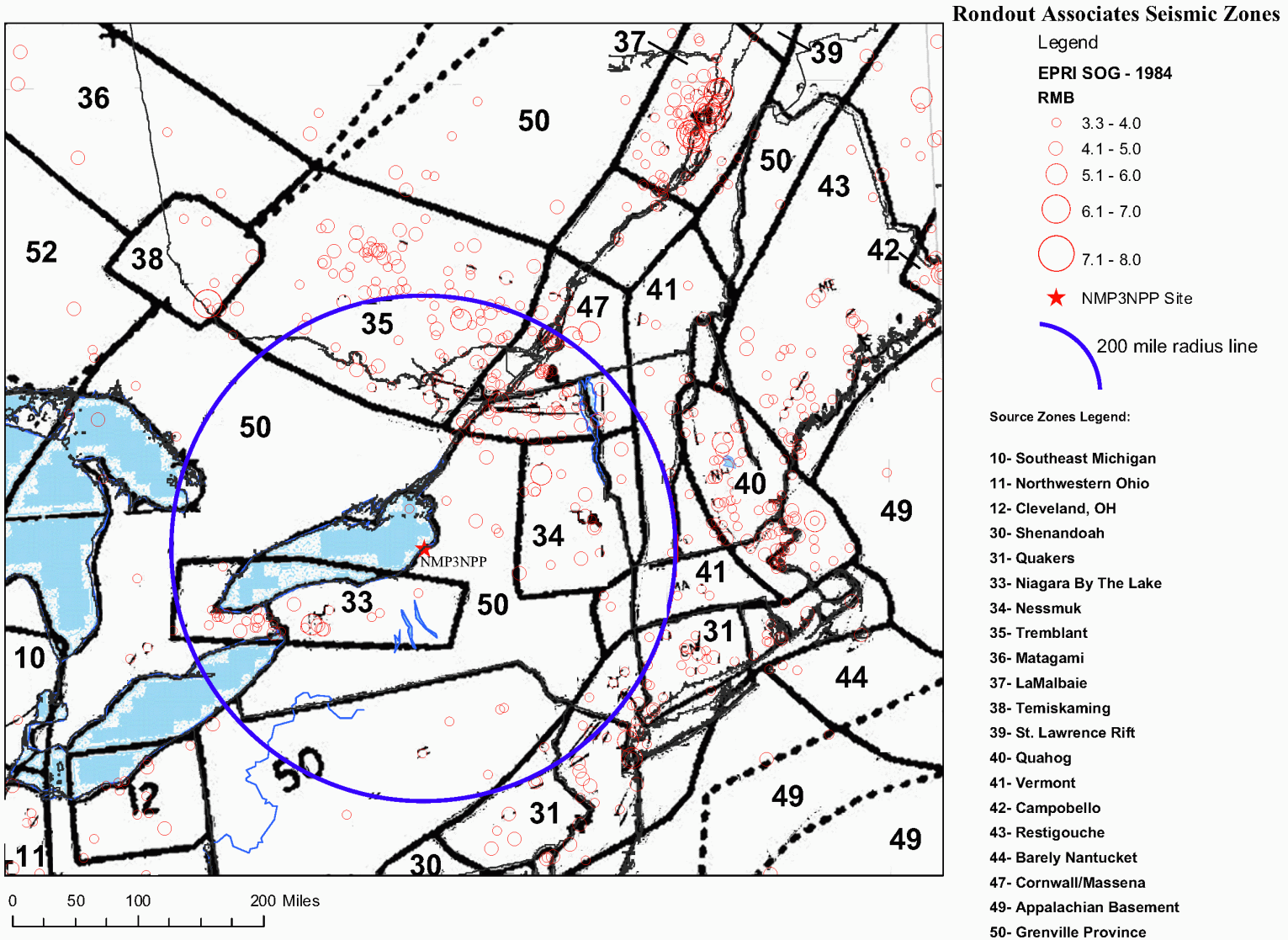


Figure 2.5-84—{Rondout Seismic Source Zones and 1985-2007 Catalog Update}

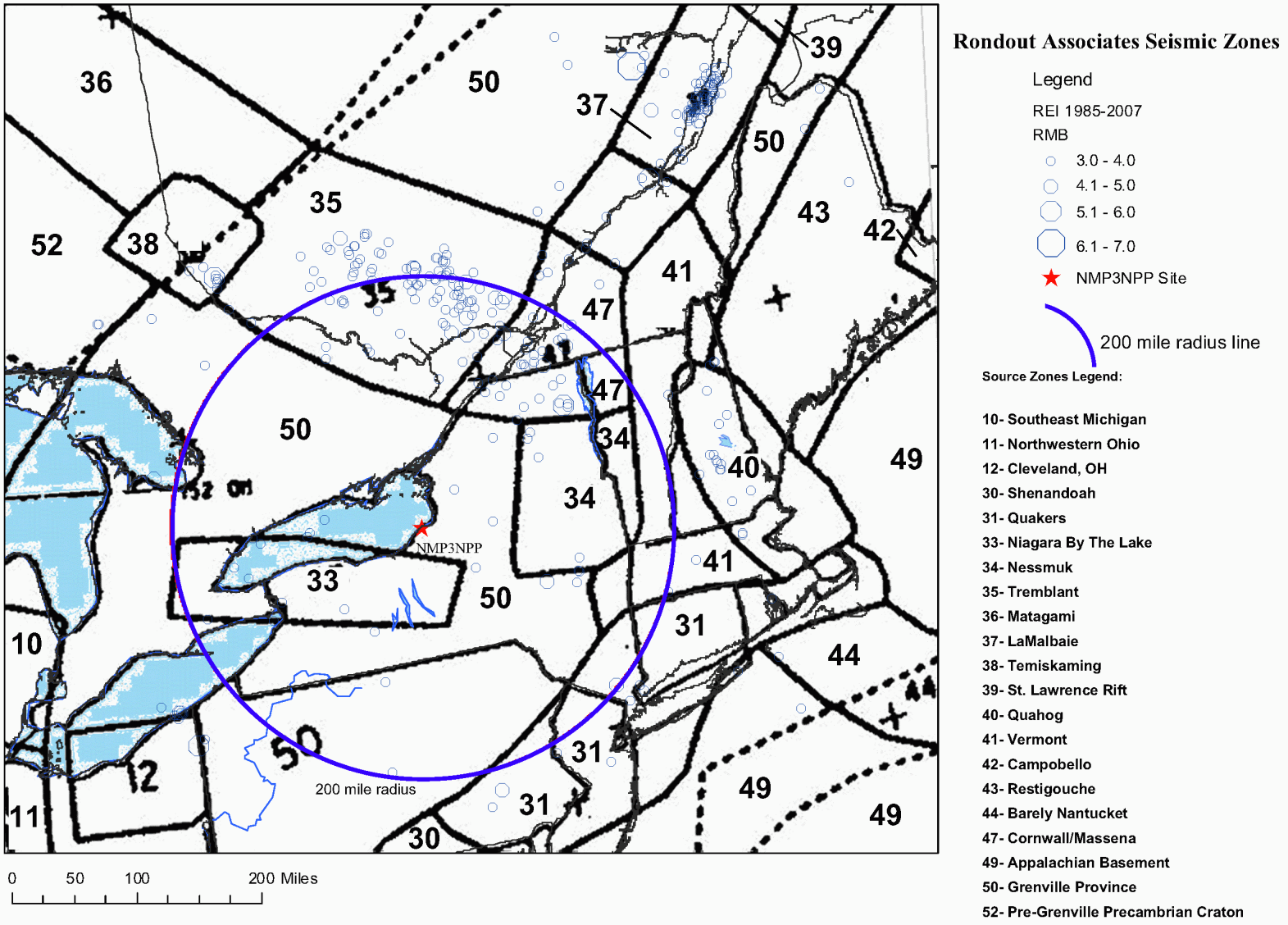


Figure 2.5-85—{Weston Geophysical Seismic Source Zones and EPRI-SOG pre-1985 Catalog}

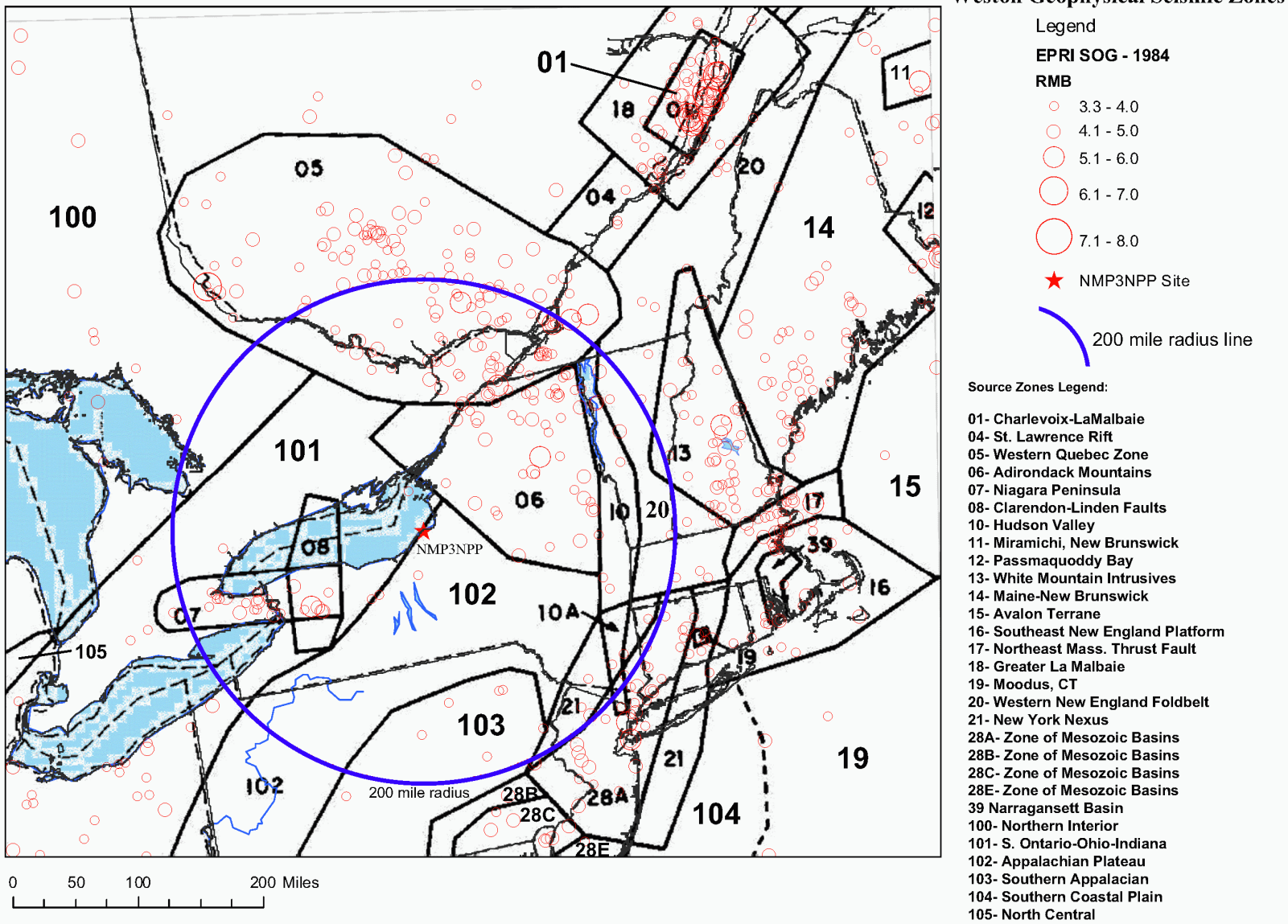


Figure 2.5-86—{Weston Geophysical Seismic Source Zones and 1985-2007 Catalog Update}

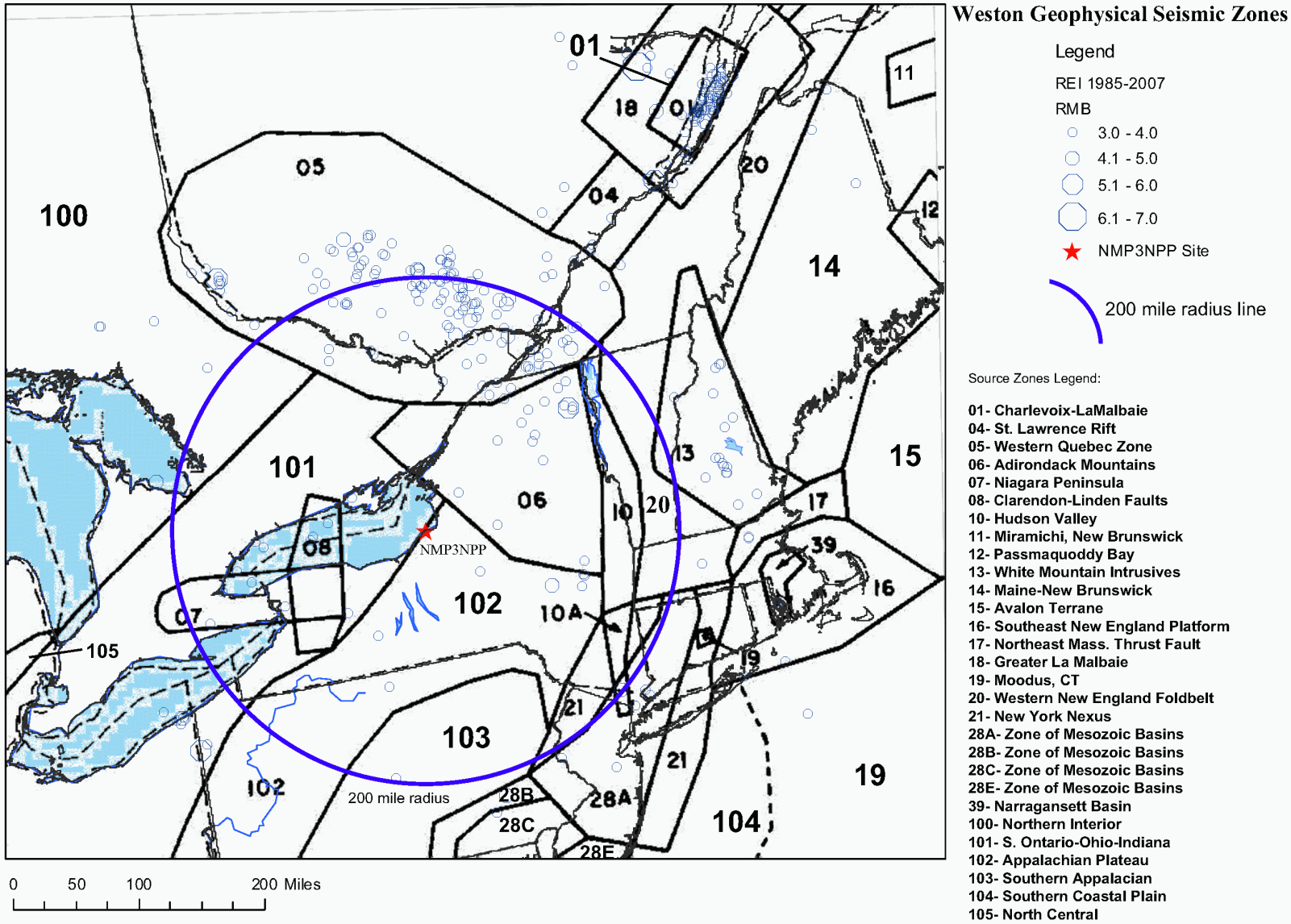


Figure 2.5-87—{Woodward-Clyde Seismic Source Zones and EPRI-SOG pre-1985 Catalog}

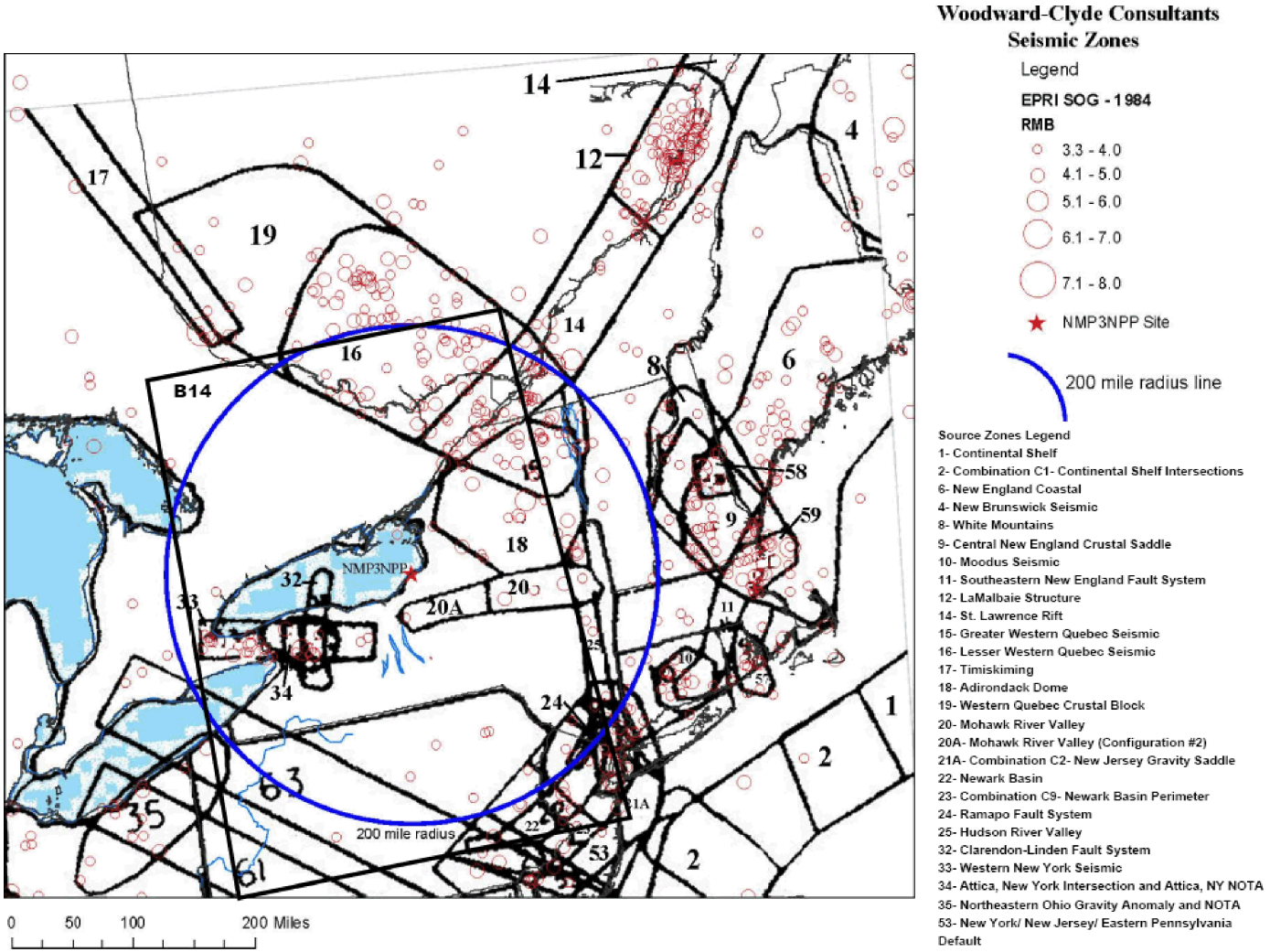


Figure 2.5-88—{Woodward-Clyde Seismic Source Zones and 1985-2007 Catalog Update}

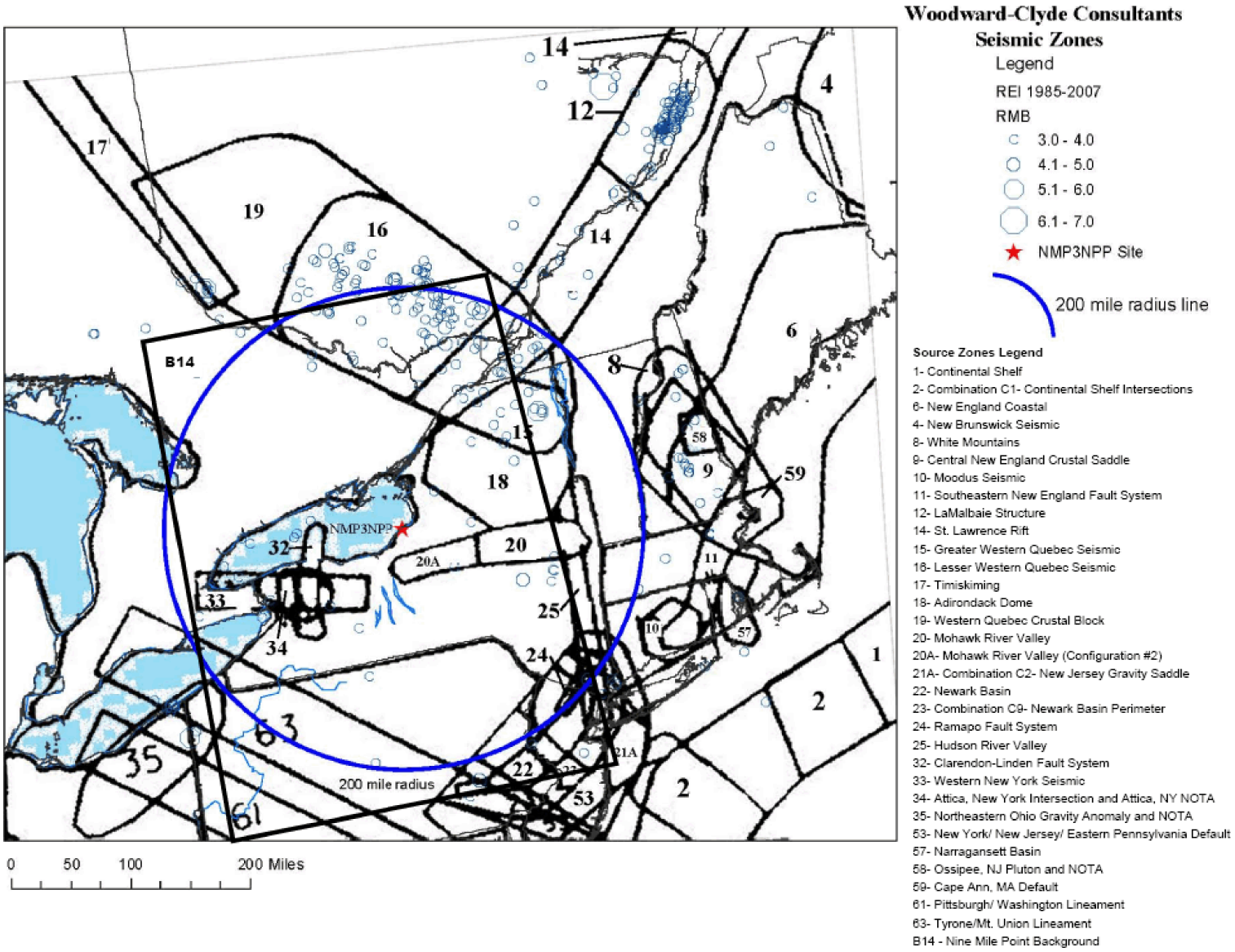


Figure 2.5-89—{Historical Seismicity in Vicinity of NMNPS Site (shown with a star) and Two Areas Used to Test the Effects of Additional Seismicity}

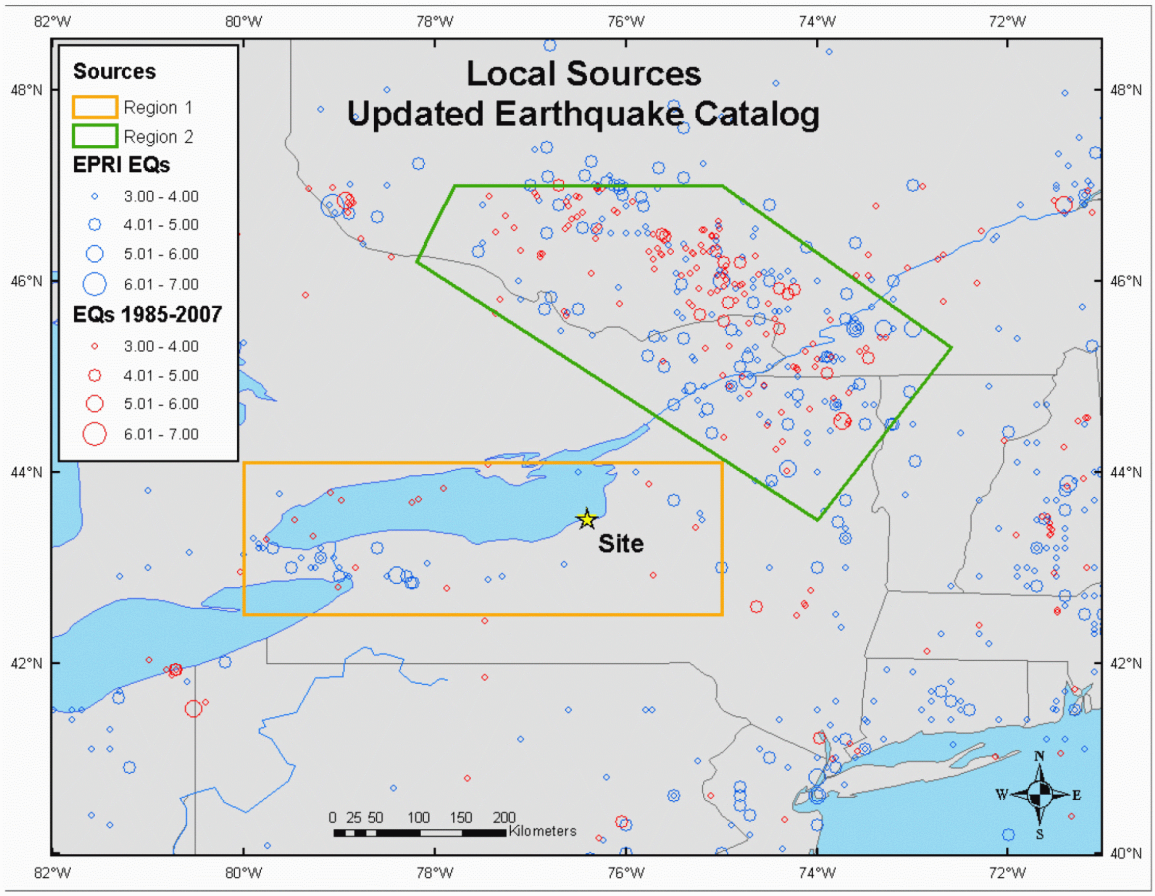


Figure 2.5-90—{Historical Seismicity in Vicinity of the Charlevoix Seismic Zone and the EPRI Team Sources Used to Represent that Zone}

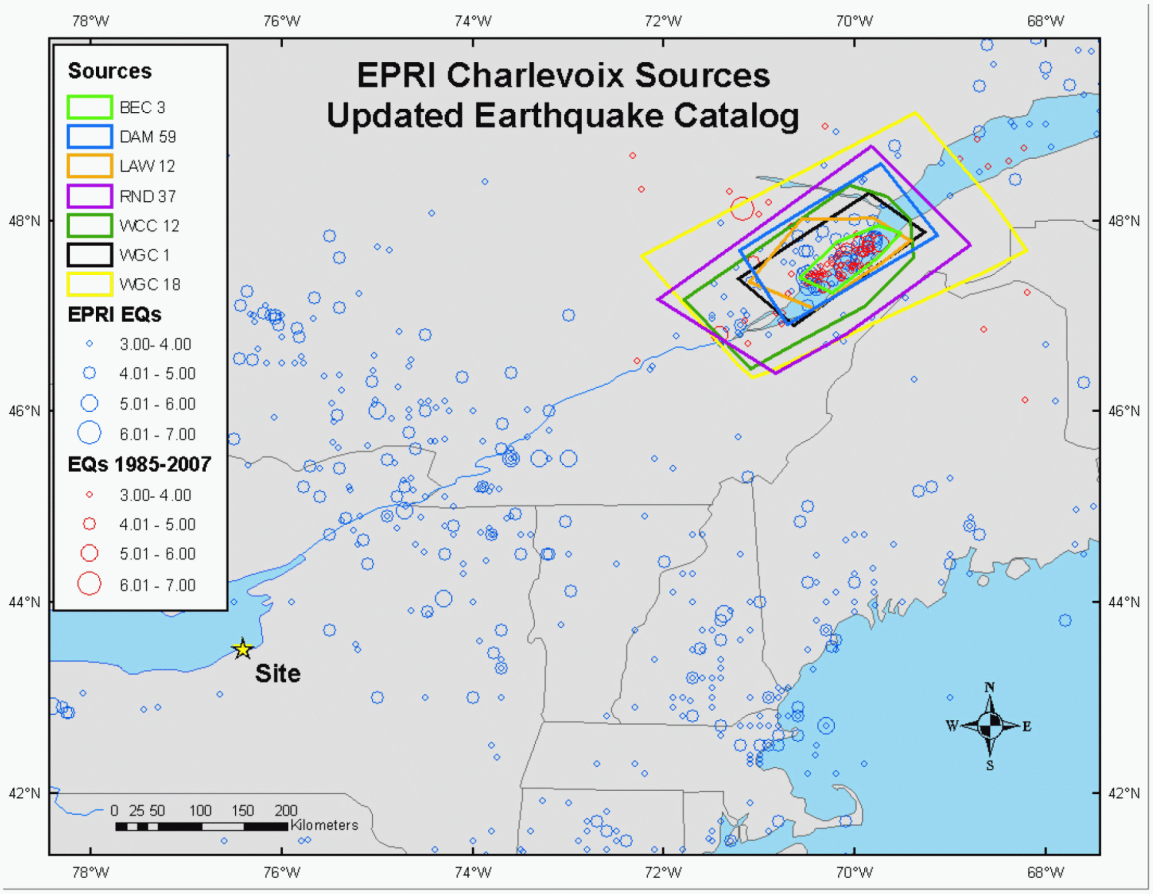


Figure 2.5-91—{Earthquake Occurrence Rates for EPRI (1989) Catalog and for Catalog Extended Through 2007 for Region 1}

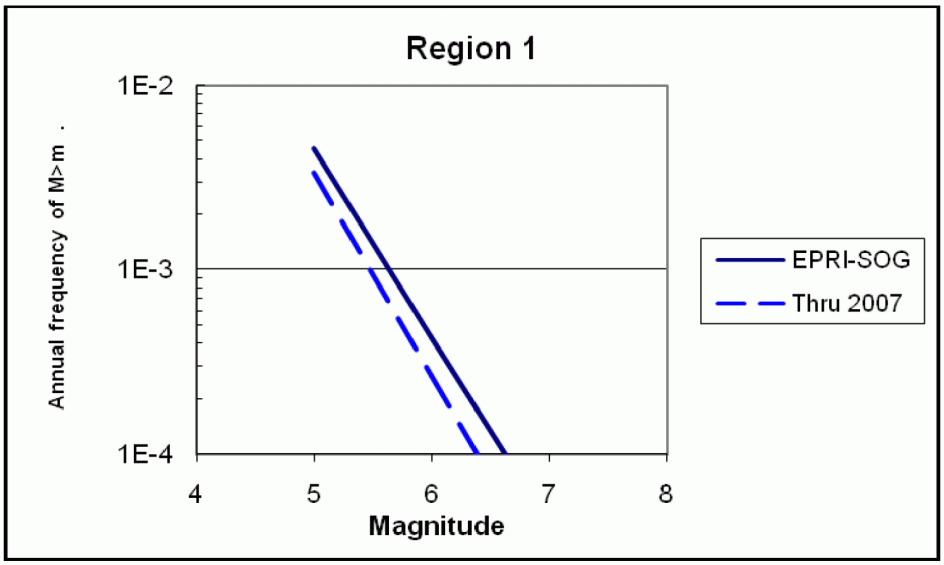


Figure 2.5-92—{Earthquake Occurrence Rates for EPRI (1989) Catalog and for Catalog Extended Through 2007 for Region 2}

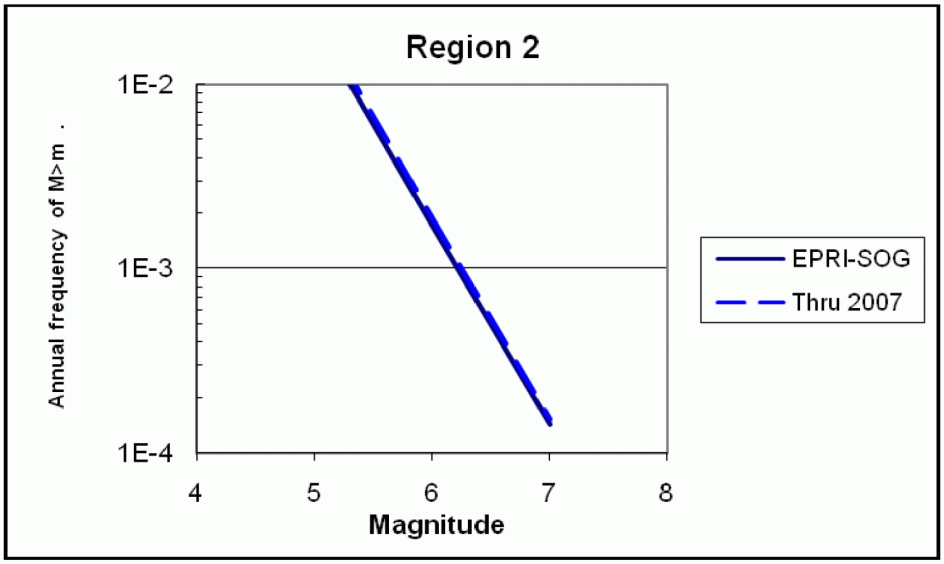


Figure 2.5-93—{Mean and Fractile PGA Seismic Hazard Curves, Rock, No CAV}

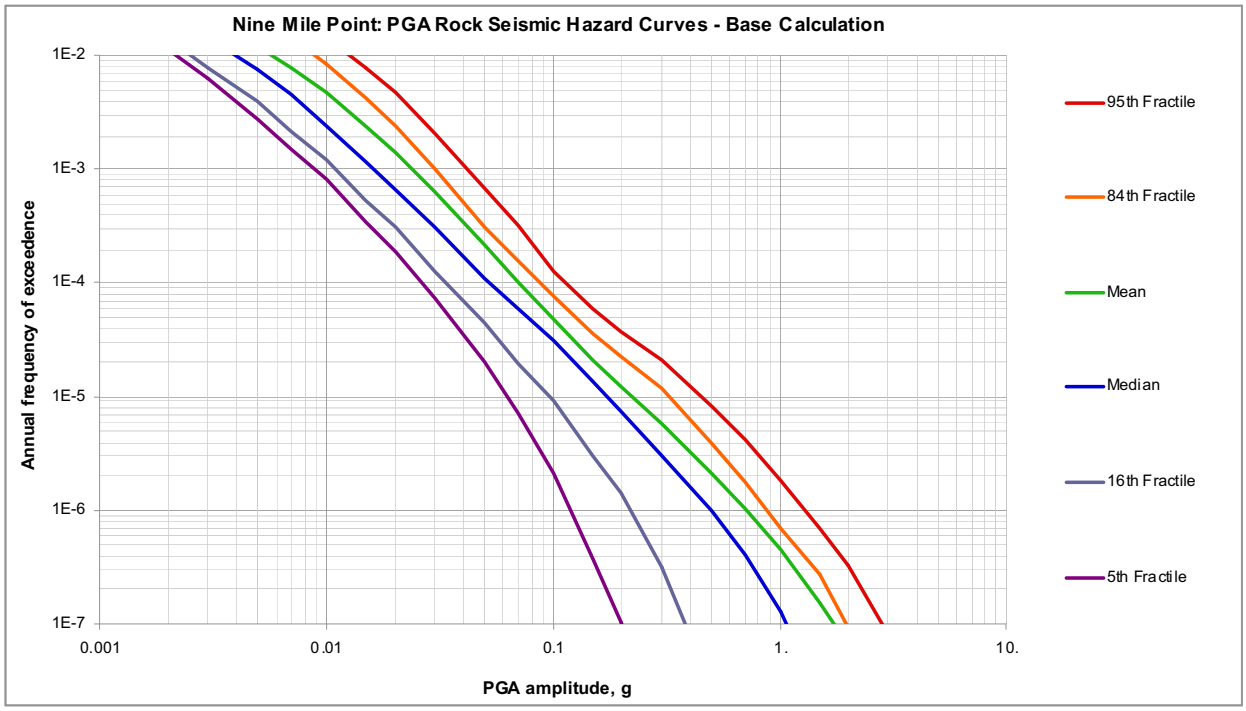


Figure 2.5-94—{Mean and Fractile 25 Hz Seismic Hazard Curves, Rock, No CAV}

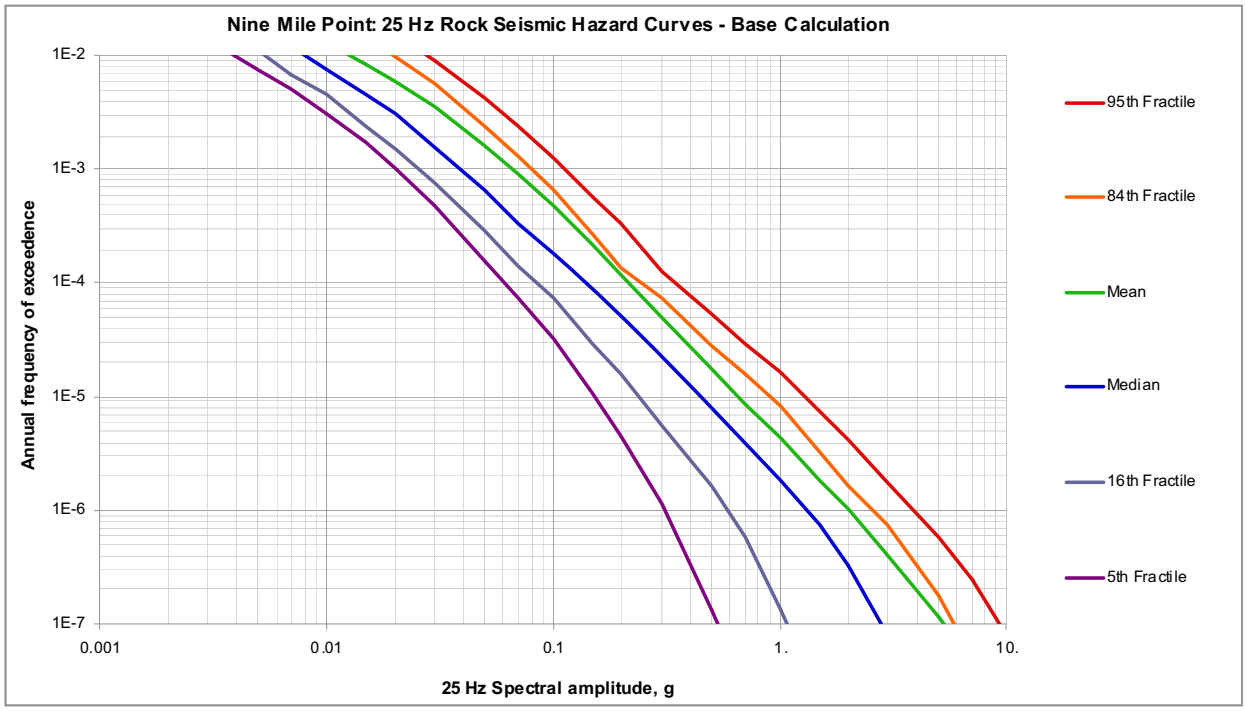


Figure 2.5-95—{Mean and Fractile 10 Hz Seismic Hazard Curves, Rock, No CAV}

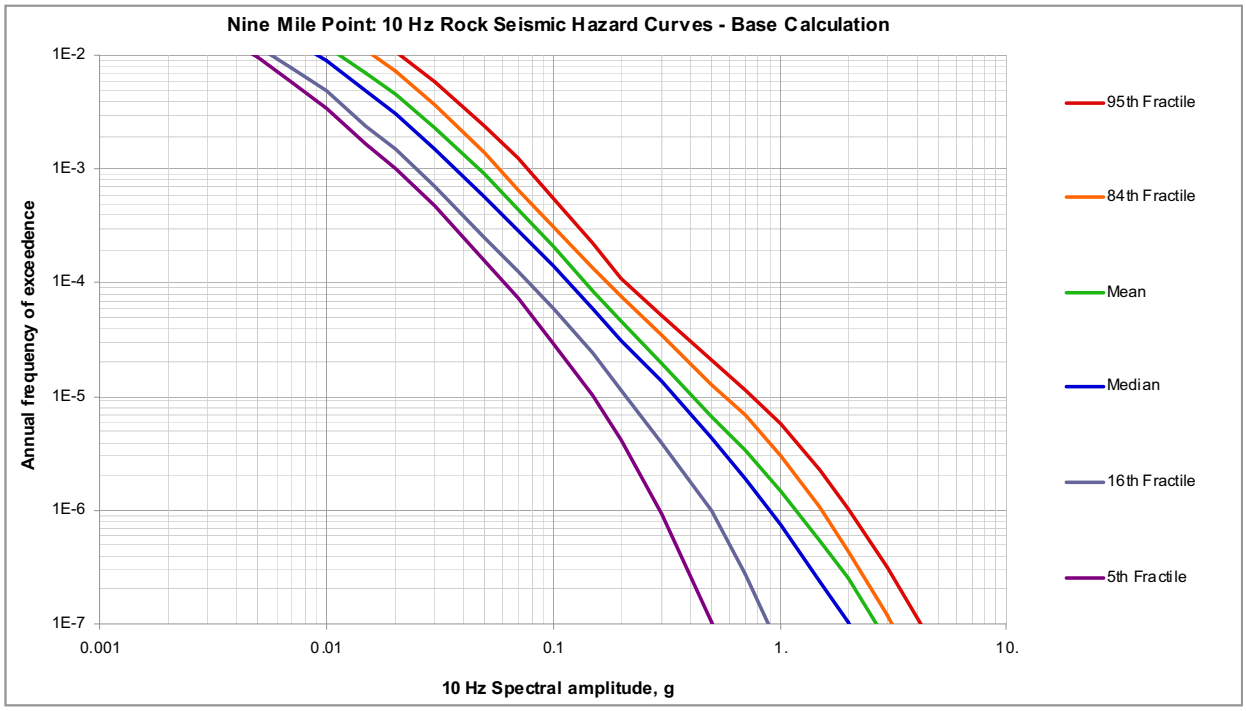


Figure 2.5-96—{Mean and Fractile 5 Hz Seismic Hazard Curves, Rock, No CAV}

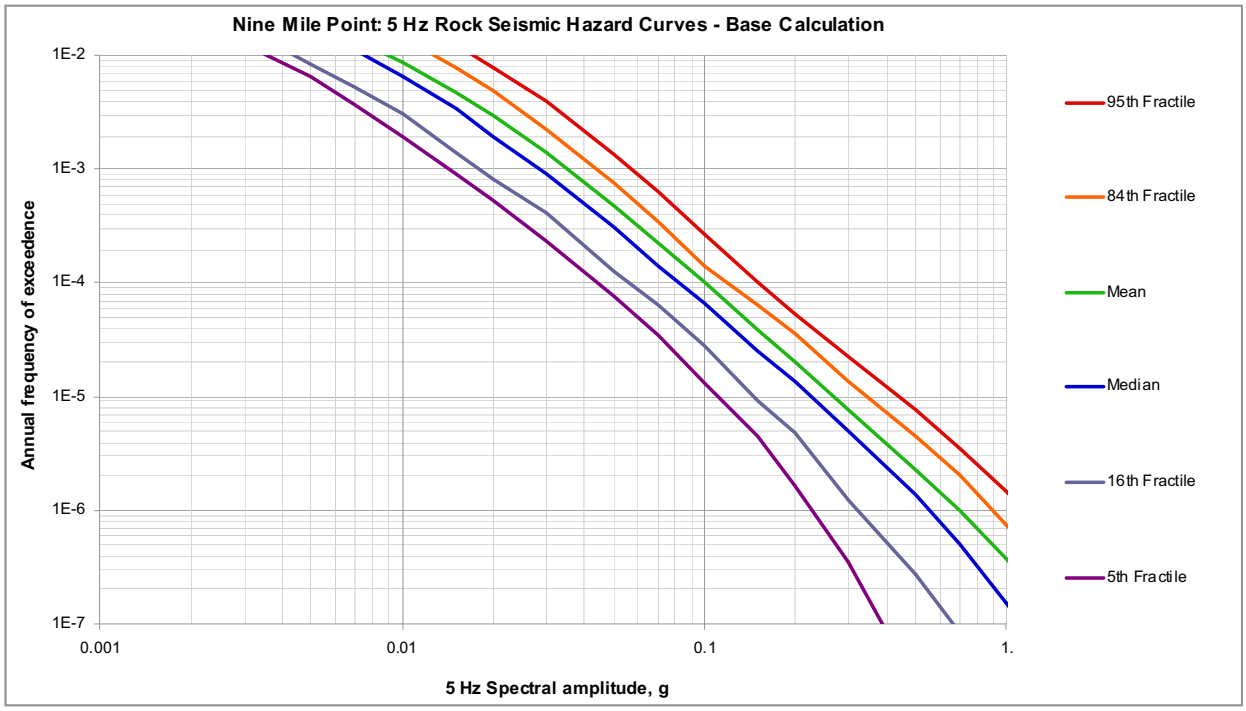


Figure 2.5-97—{Mean and Fractile 2.5 Hz Seismic Hazard Curves, Rock, No CAV}

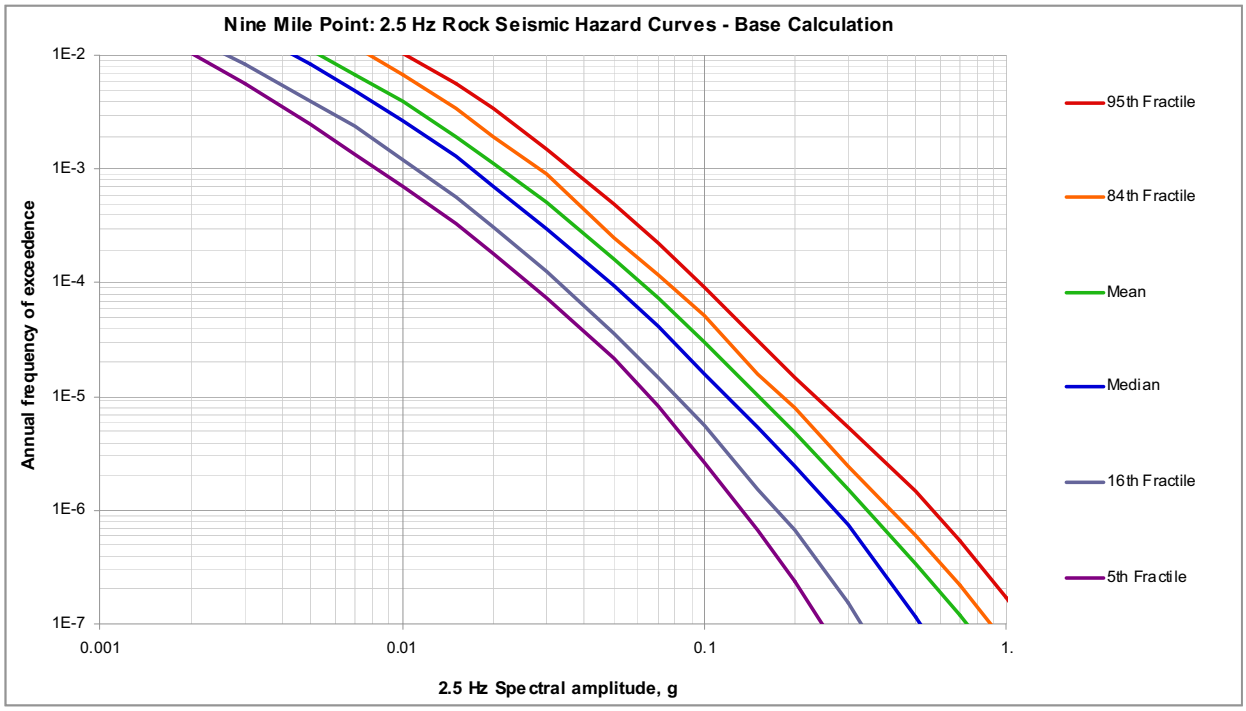


Figure 2.5-98—{Mean and Fractile 1 Hz Seismic Hazard Curves, Rock, No CAV}

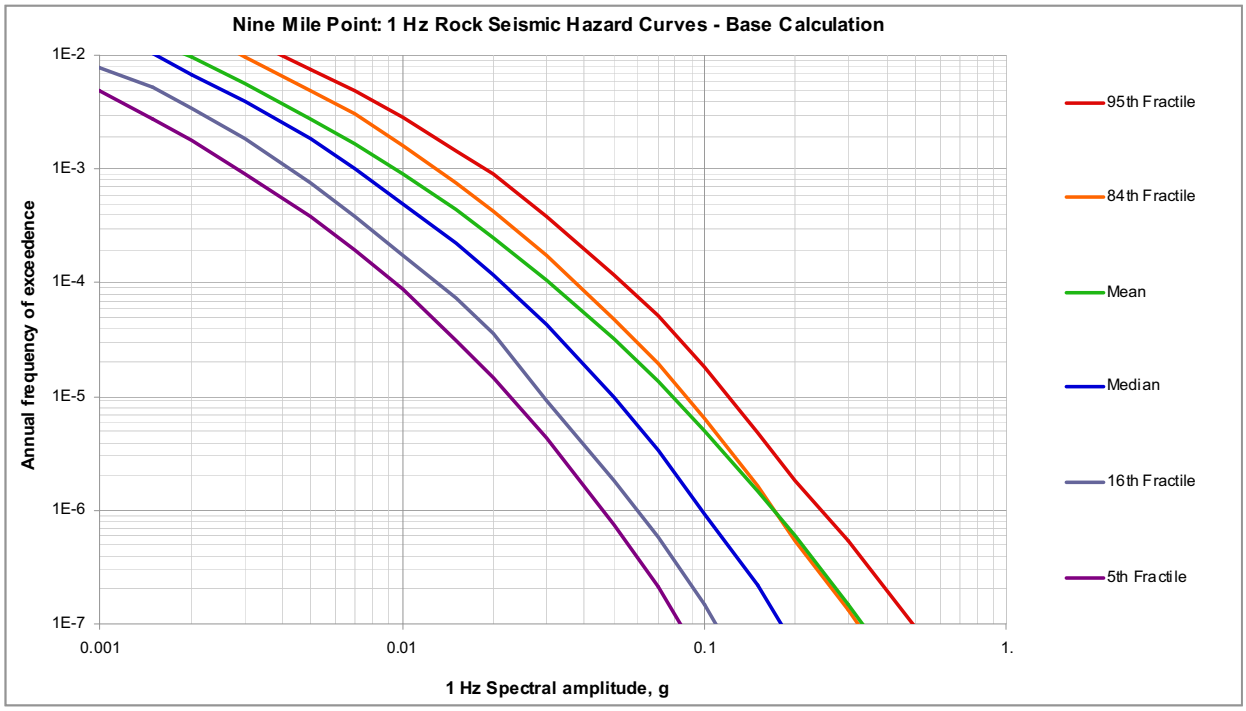


Figure 2.5-99—{Mean and Fractile 0.5 Hz Seismic Hazard Curves, Rock, No CAV}

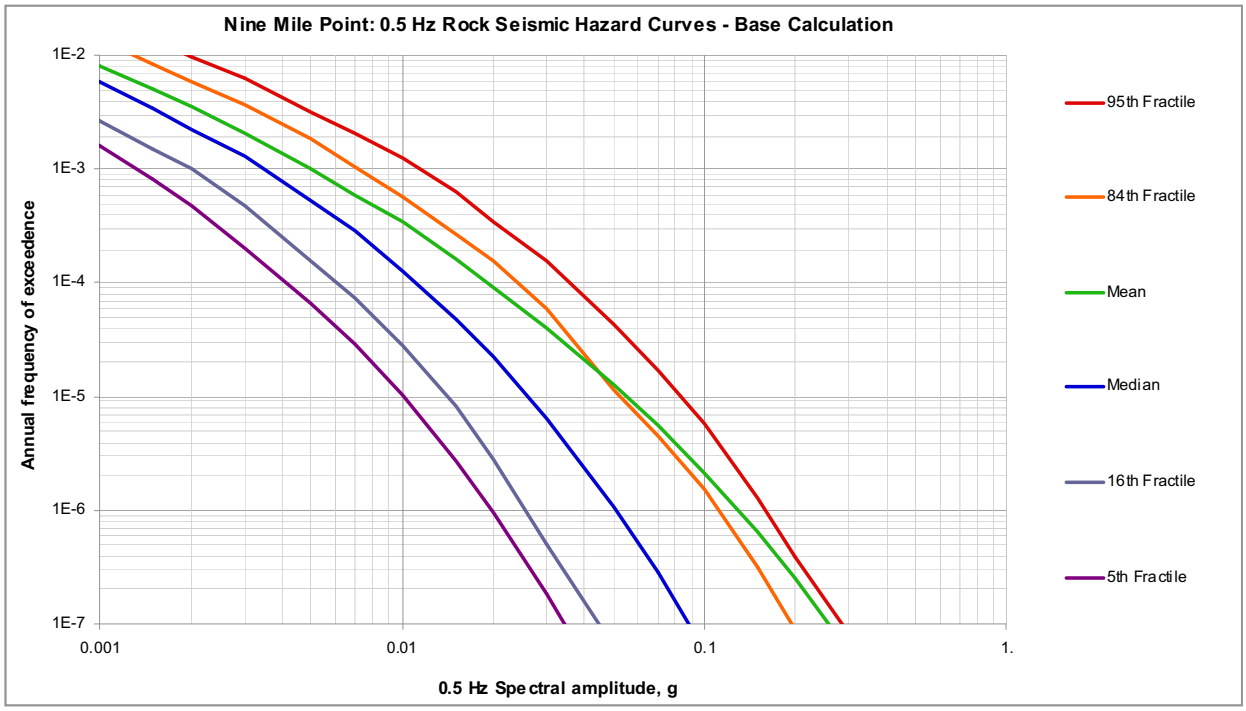
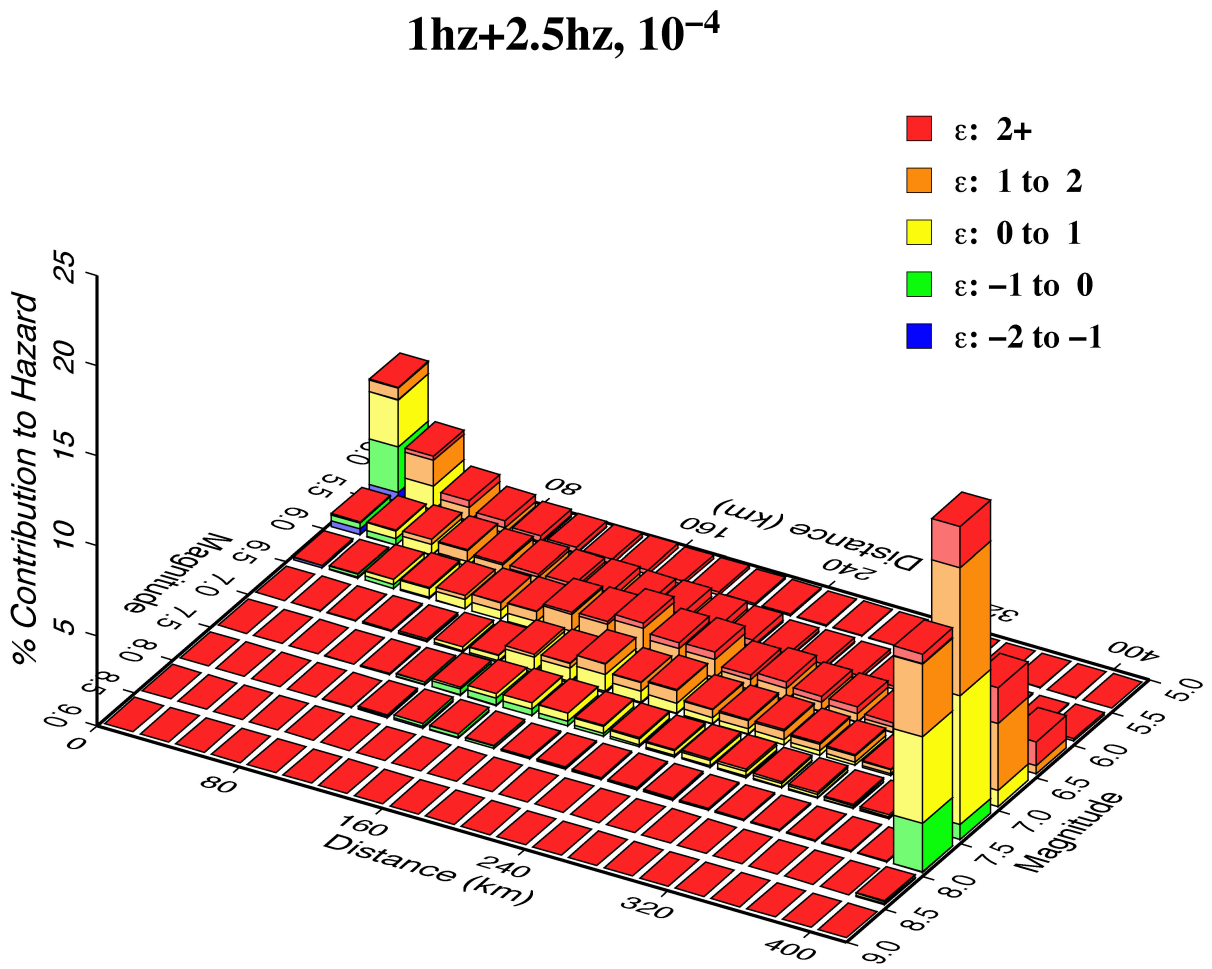
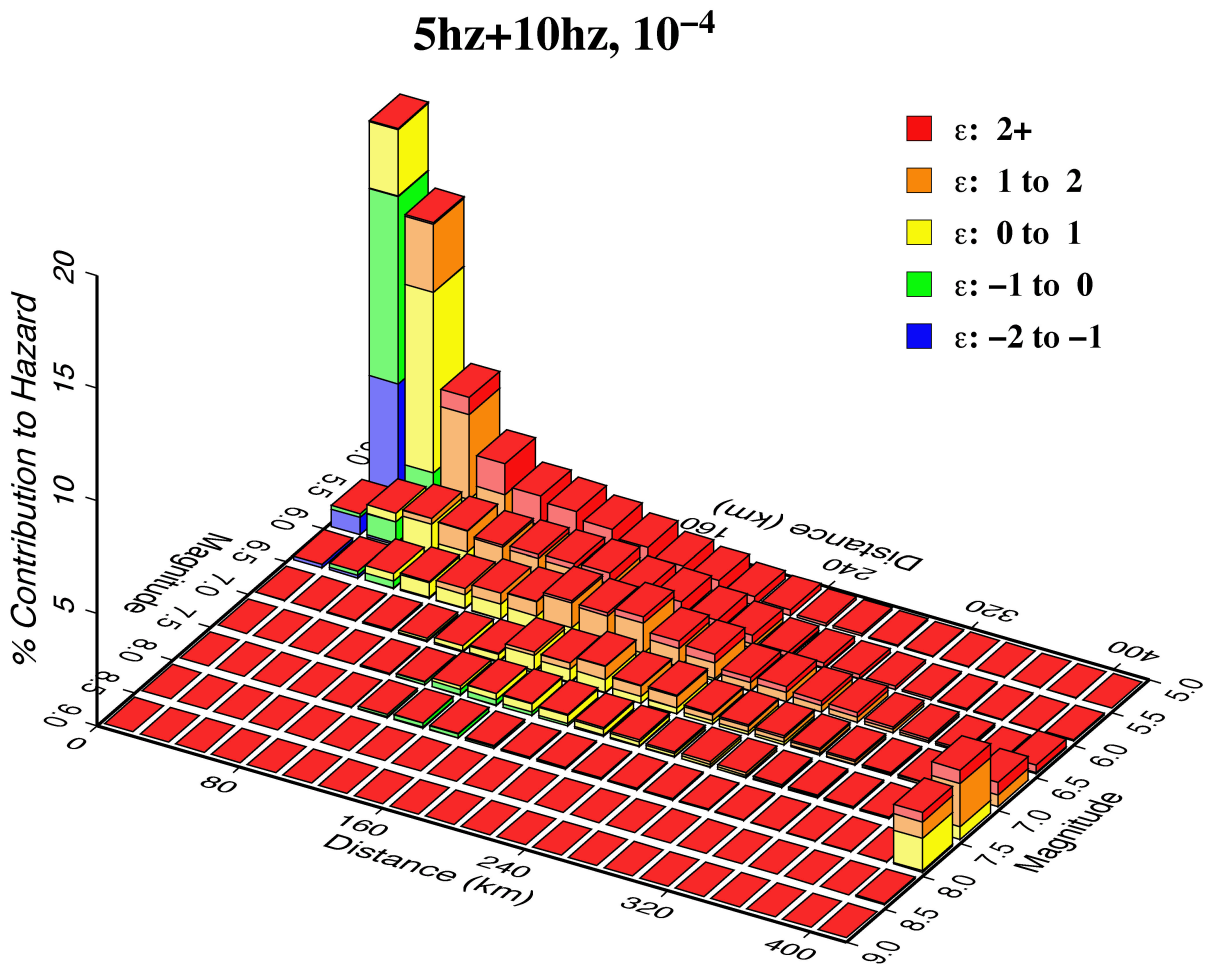


Figure 2.5-100—{M and R Deaggregation for 1 and 2.5 Hz at 10^{-4} Annual Frequency of Exceedence}



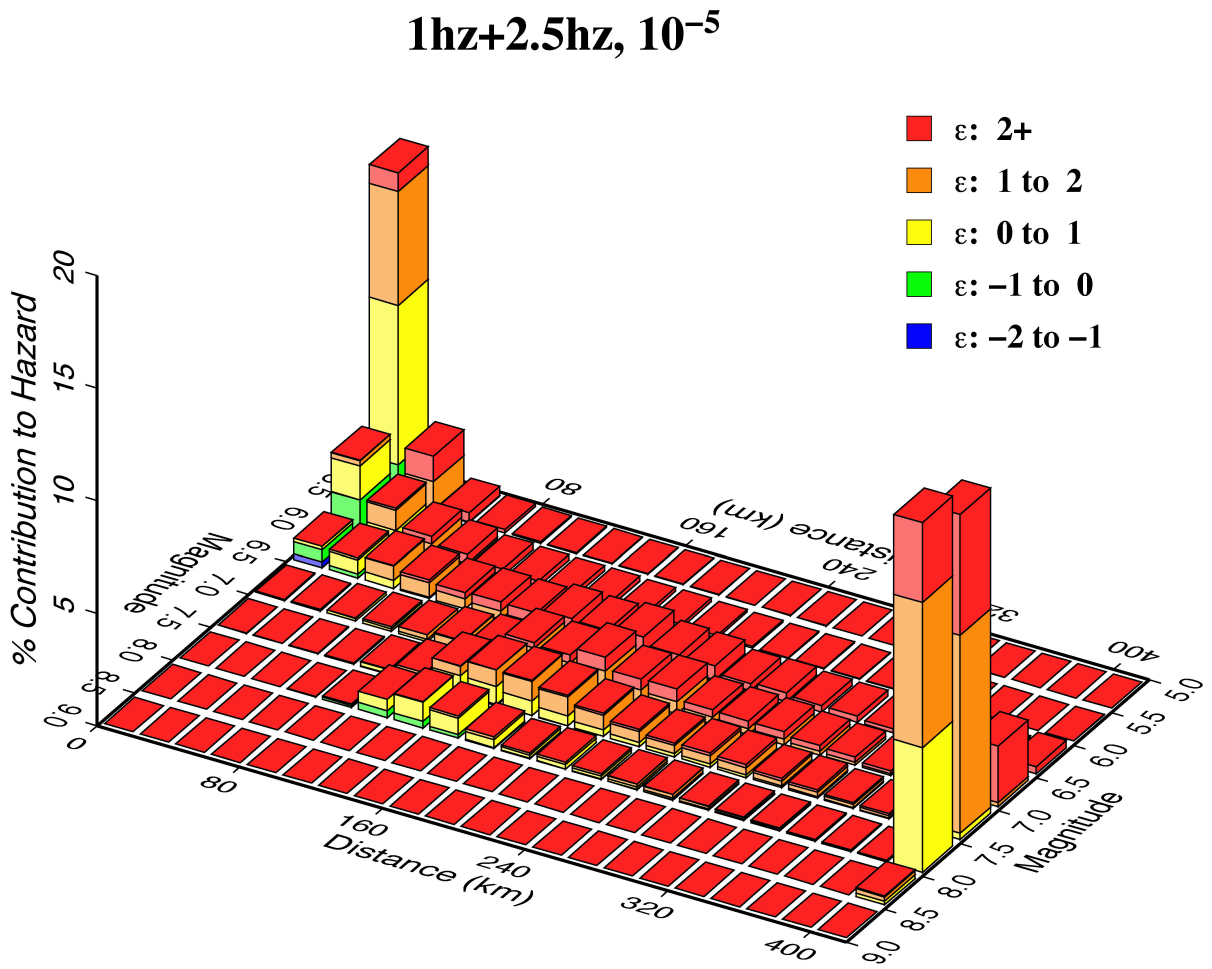
Note that the last distance bin includes all contributions for R>400 km

Figure 2.5-101—{M and R Deaggregation for 5 and 10 Hz at 10^{-4} Annual Frequency of Exceedence}



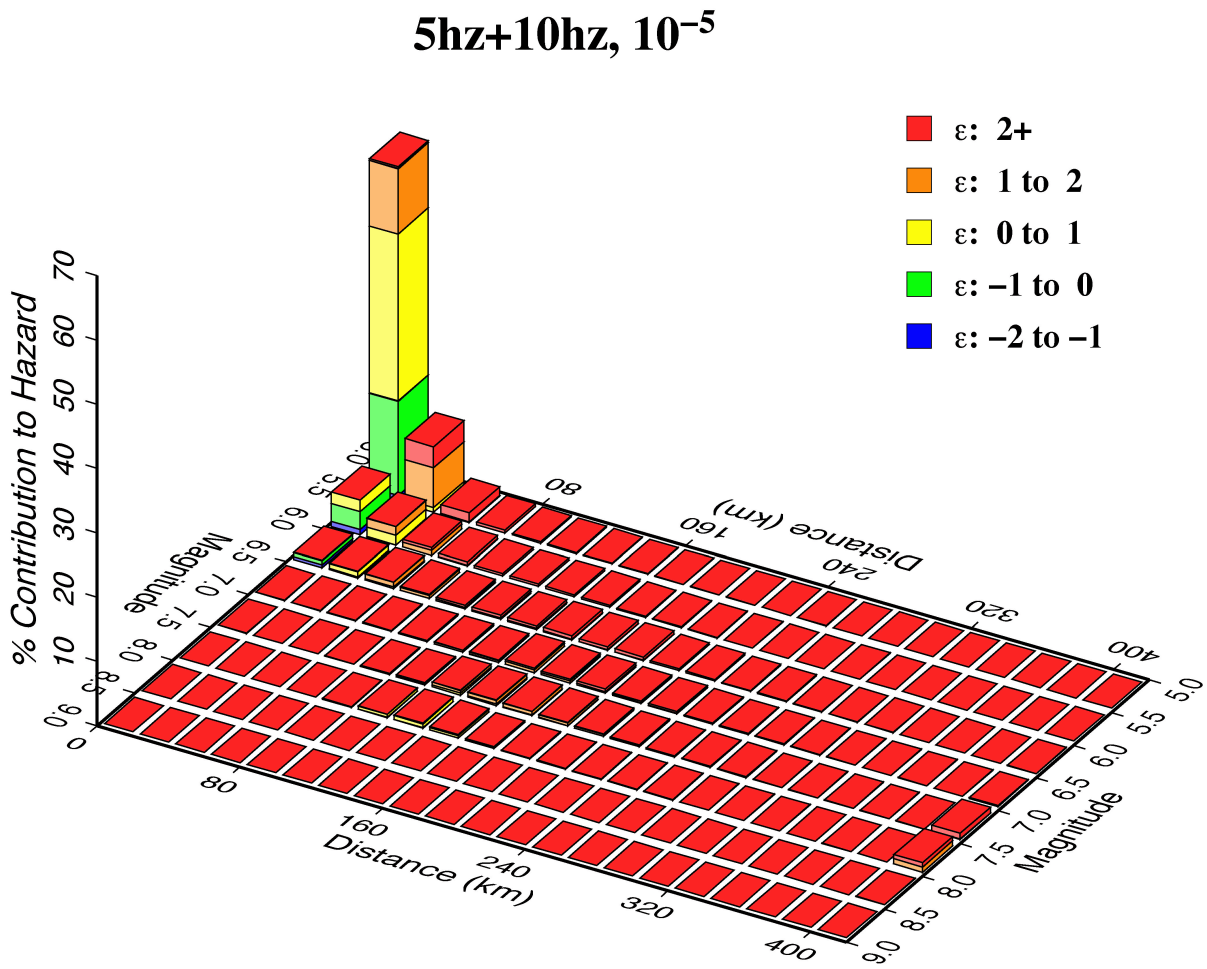
Note that the last distance bin includes all contributions for R>400 km

Figure 2.5-102—{M and R Deaggregation for 1 and 2.5 Hz at 10^{-5} Annual Frequency of Exceedence}



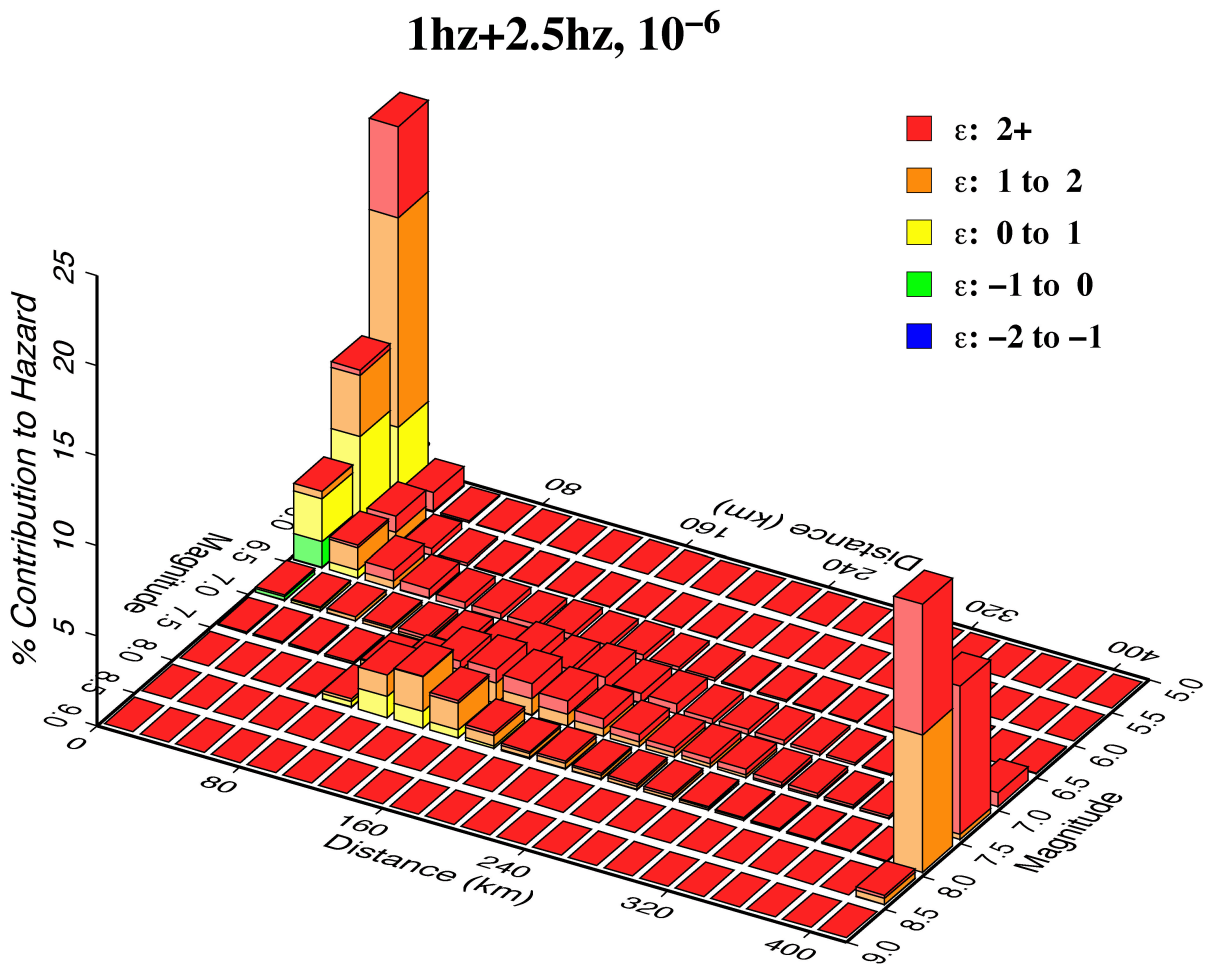
Note that the last distance bin includes all contributions for R>400 km

Figure 2.5-103—{M and R Deaggregation for 5 and 10 Hz at 10^{-5} Annual Frequency of Exceedence}



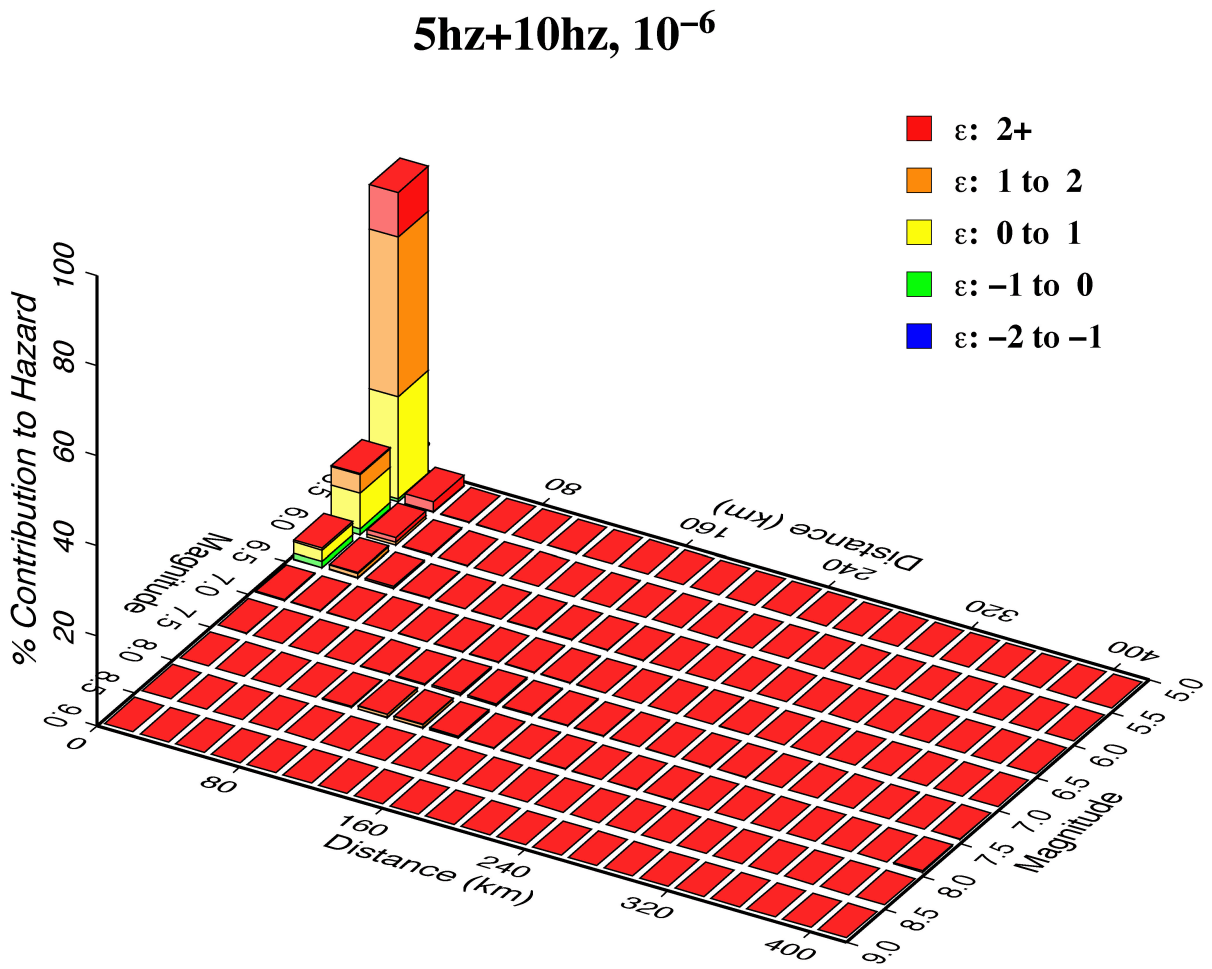
Note that the last distance bin includes all contributions for R>400 km

Figure 2.5-104—{M and R Deaggregation for 1 and 2.5 Hz at 10^{-6} Annual Frequency of Exceedence}



Note that the last distance bin includes all contributions for R>400 km

Figure 2.5-105—{M and R Deaggregation for 5 and 10 Hz at 10^{-6} Annual Frequency of Exceedence}



Note that the last distance bin includes all contributions for R>400 km

Figure 2.5-106—{Smooth 10^{-4} UHRS for HF and LF Earthquakes}

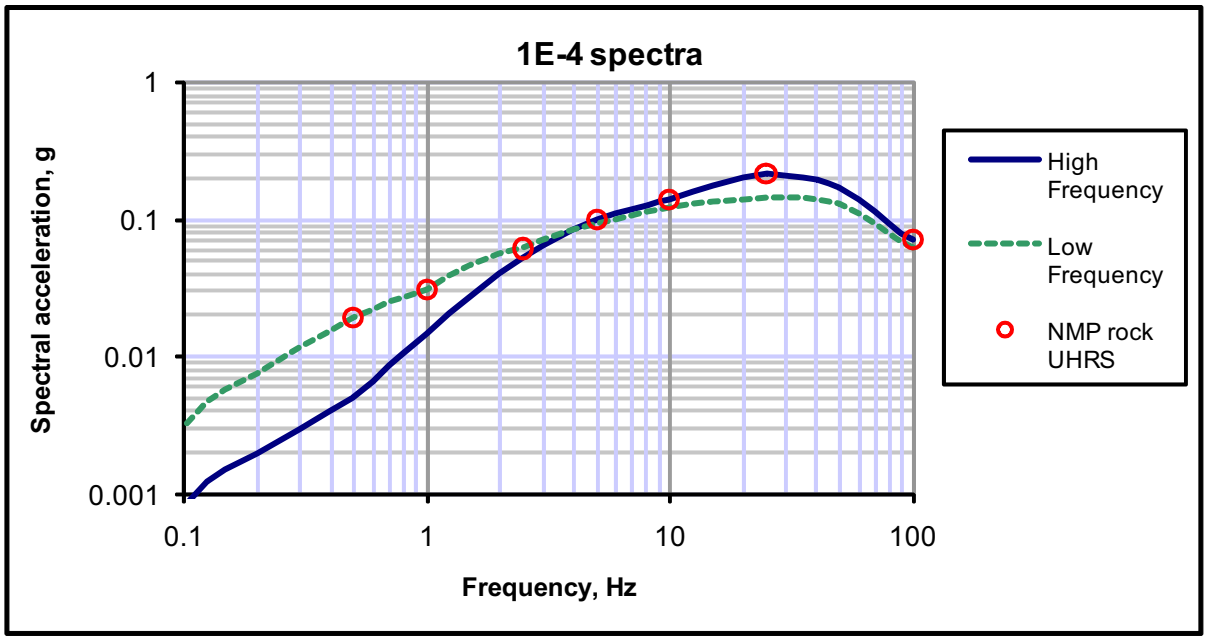


Figure 2.5-107—{Smooth 10^{-5} UHRS for HF and LF Earthquakes}

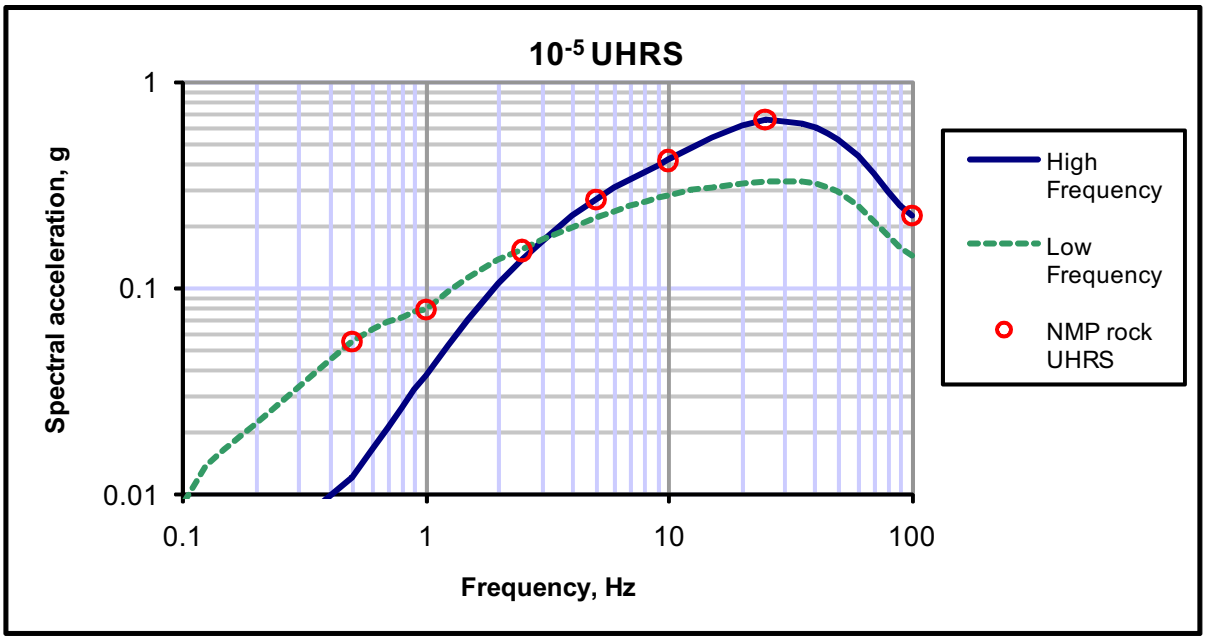


Figure 2.5-108—{Smooth 10^{-6} UHRS for HF and LF Earthquakes}

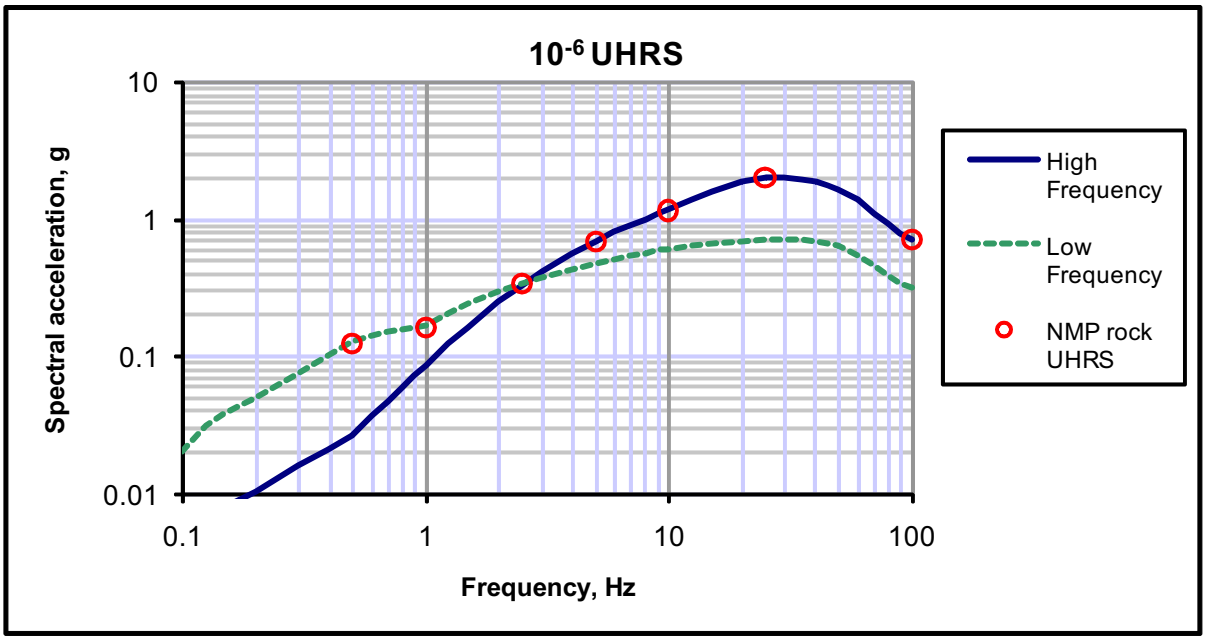


Figure 2.5-109—{Artificial V_S Profiles 1 through 10 for the GMRS Calculations}

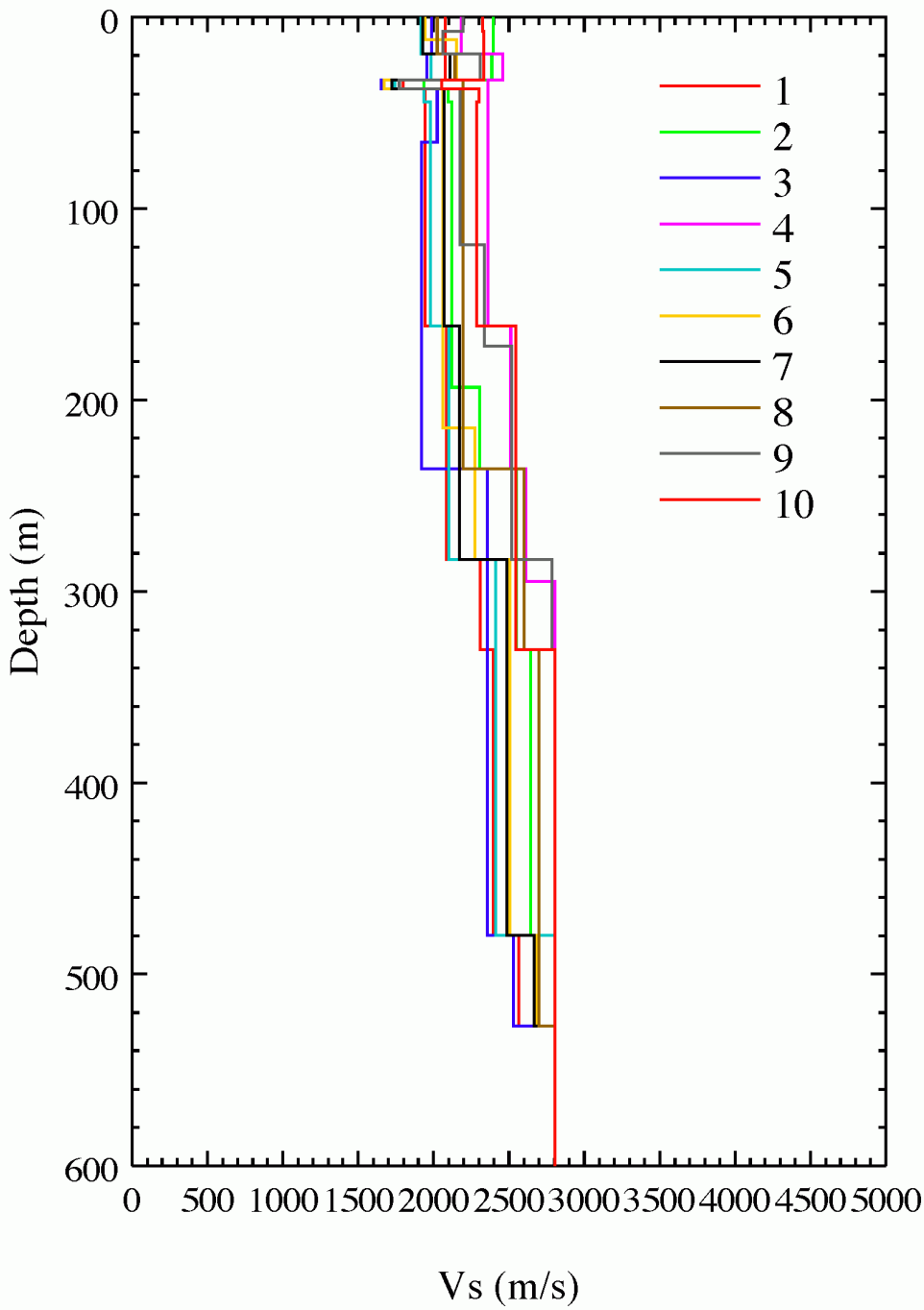


Figure 2.5-110—{Summary Statistics of V_S for the GMRS Calculations}

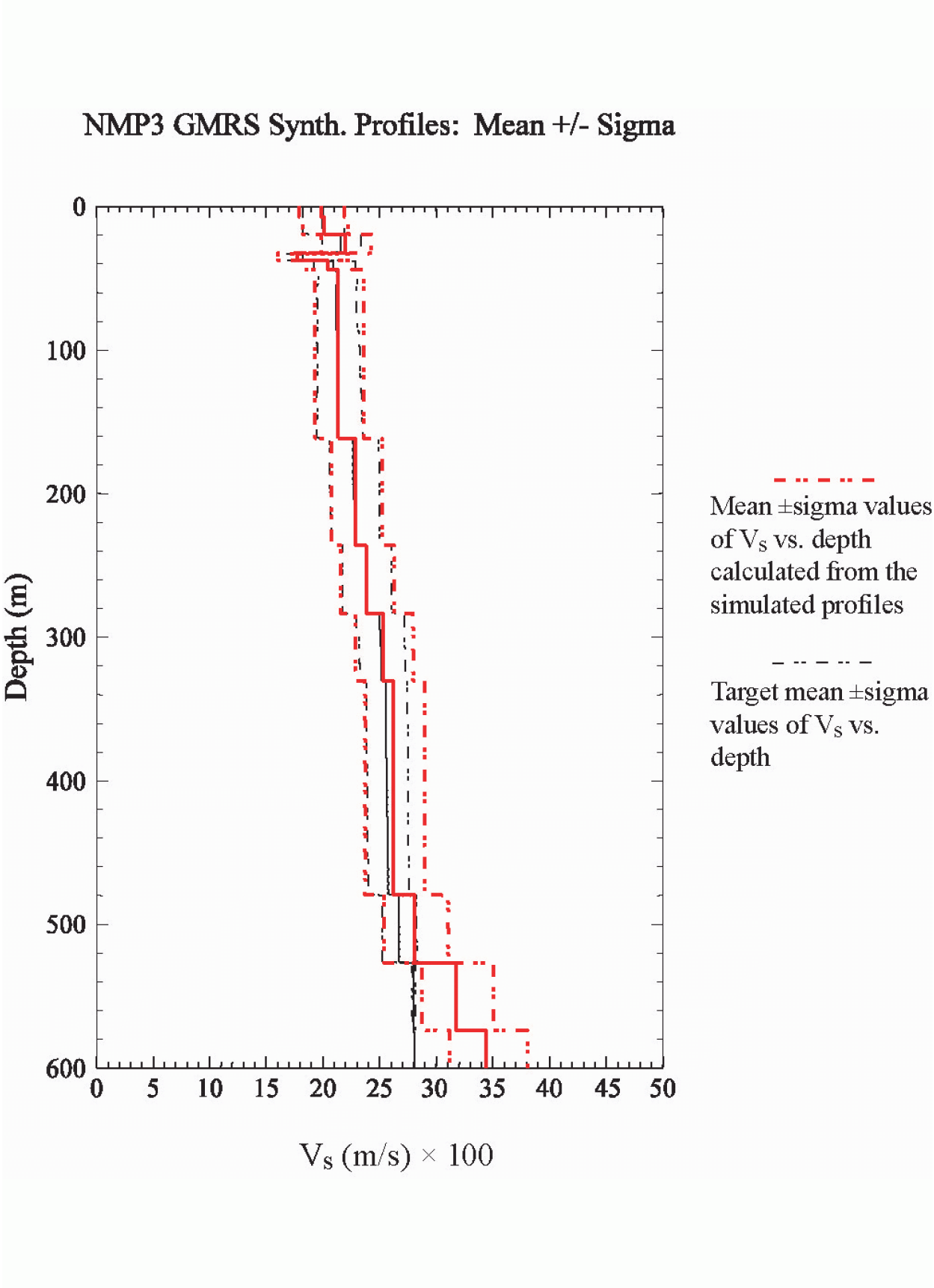


Figure 2.5-111—{Randomized G/Gmax Curves for the Oswego Sandstone}

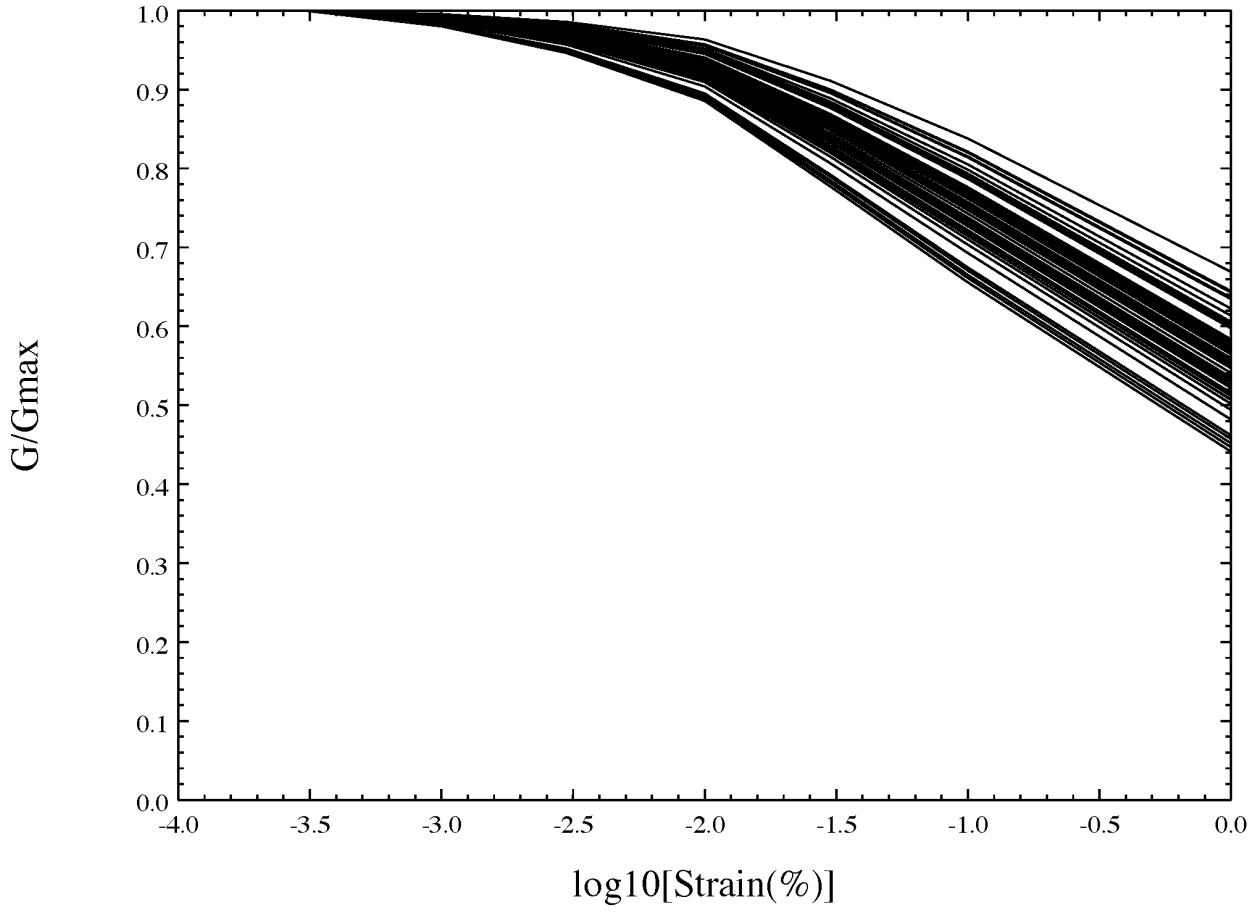


Figure 2.5-112—{Randomized Damping Curves for the Oswego Sandstone}

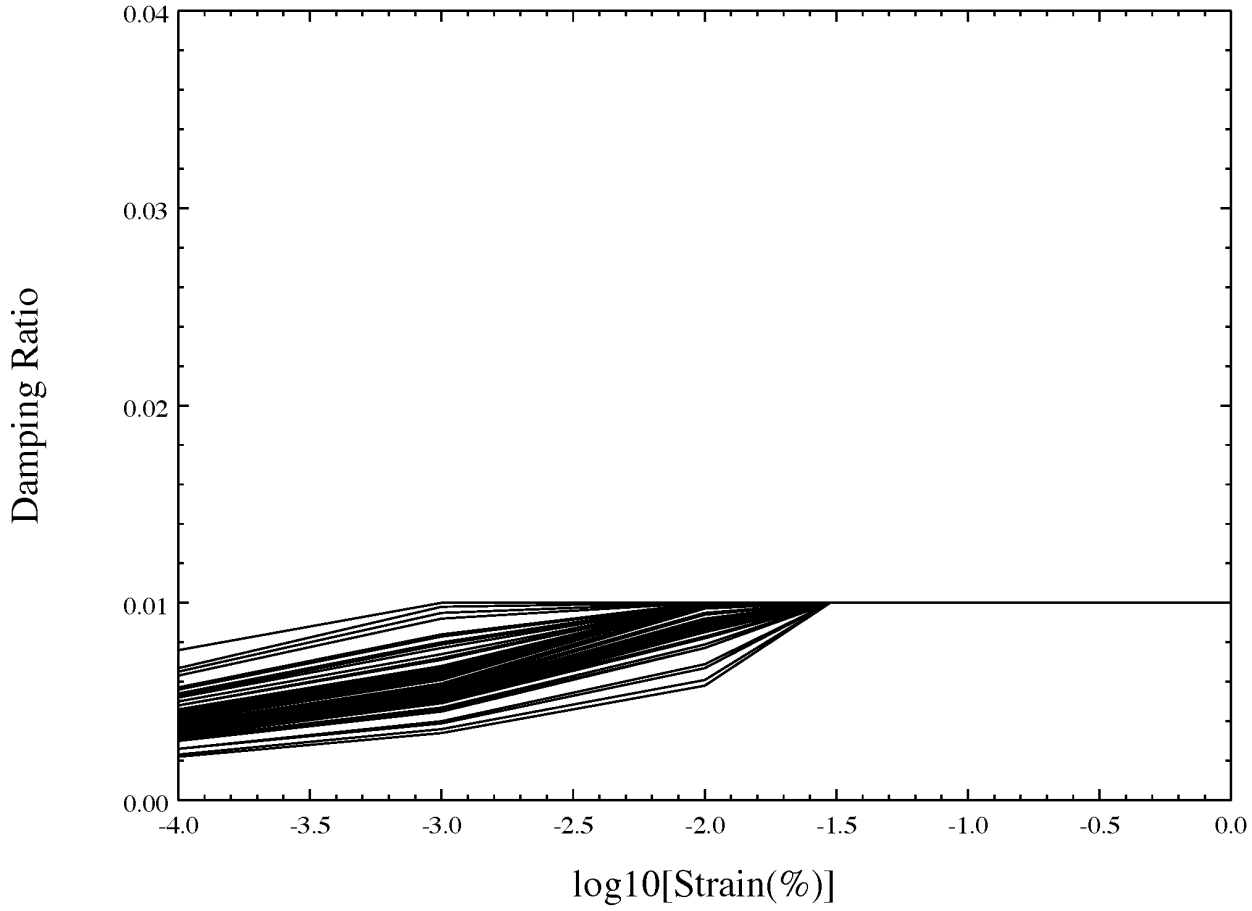


Figure 2.5-113—{Response Spectra and Logarithmic Sigma at GMRS Elevation for 1E-4 HF Input Motion}

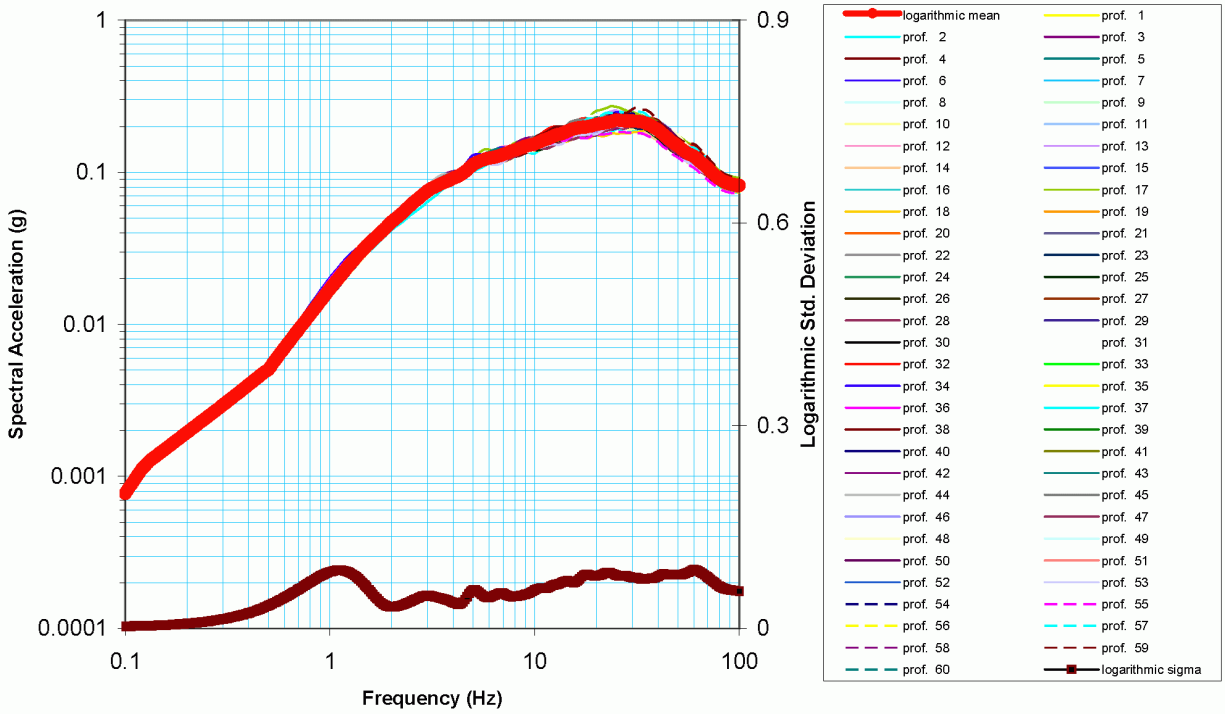


Figure 2.5-114—{Amplification Factor and Logarithmic Sigma at GMRS Elevation for 1E-4 HF Input Motion}

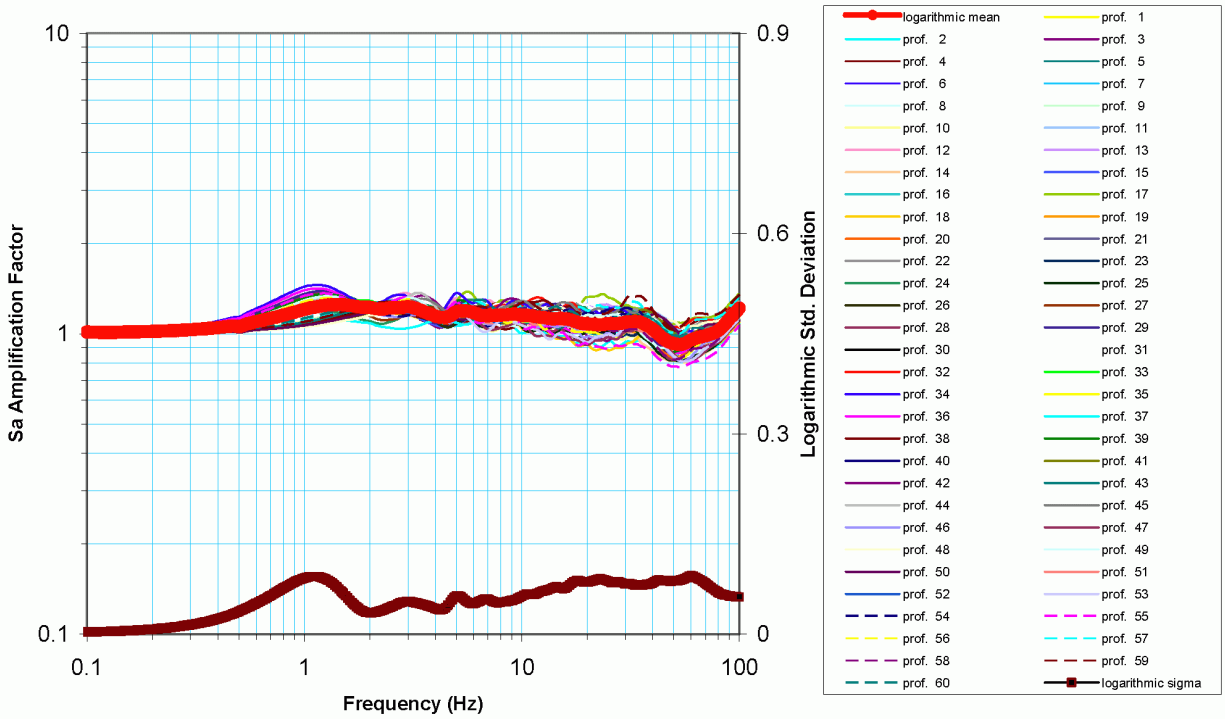


Figure 2.5-115—{Maximum Strain vs. Depth at GMRS Elevation for 1E-4 HF Input Motion}

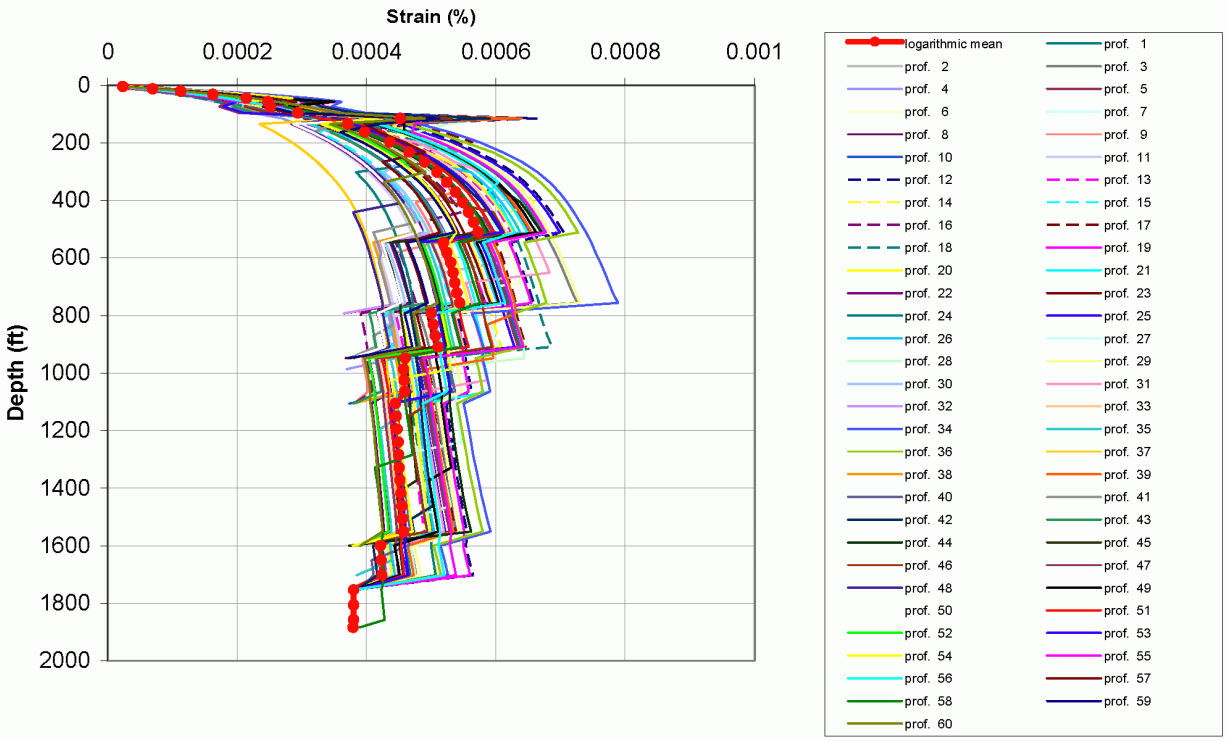


Figure 2.5-116—{Damping Ratio vs. Depth at GMRS Elevation for 1E-4 HF Input Motion}

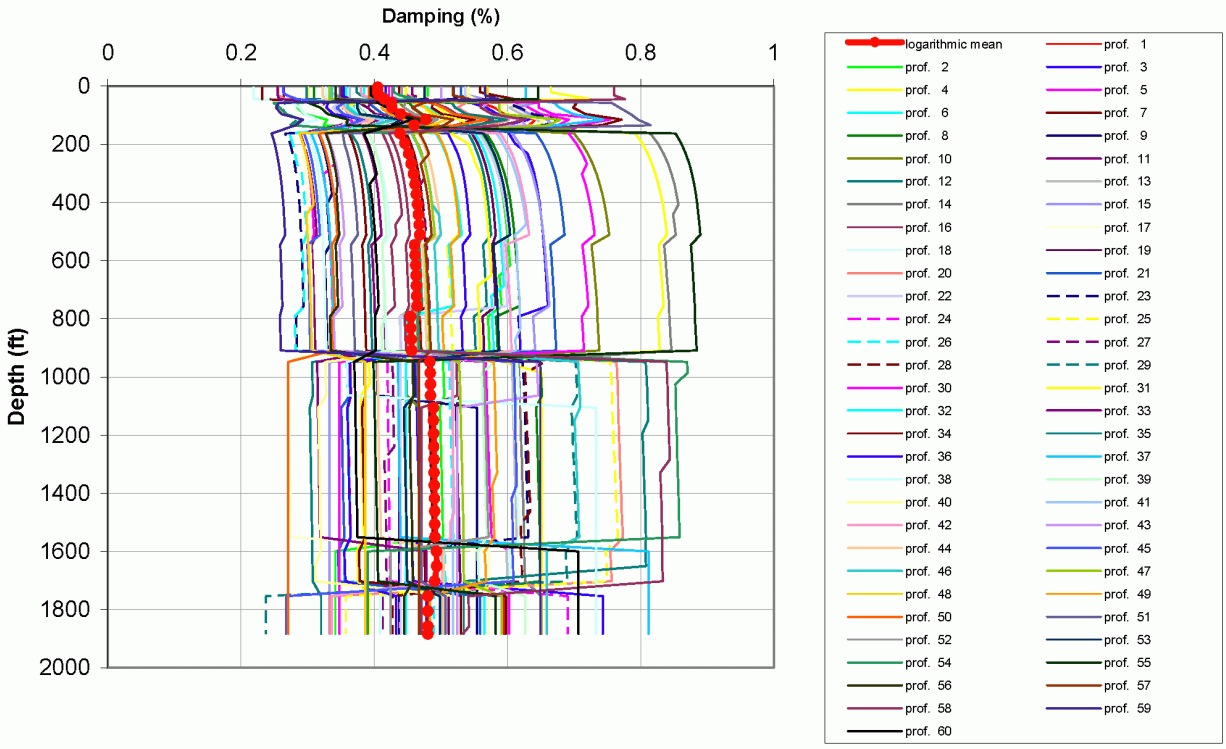


Figure 2.5-117—{Response Spectra and Logarithmic Sigma at GMRS Elevation for 1E-4 LF Input Motion}

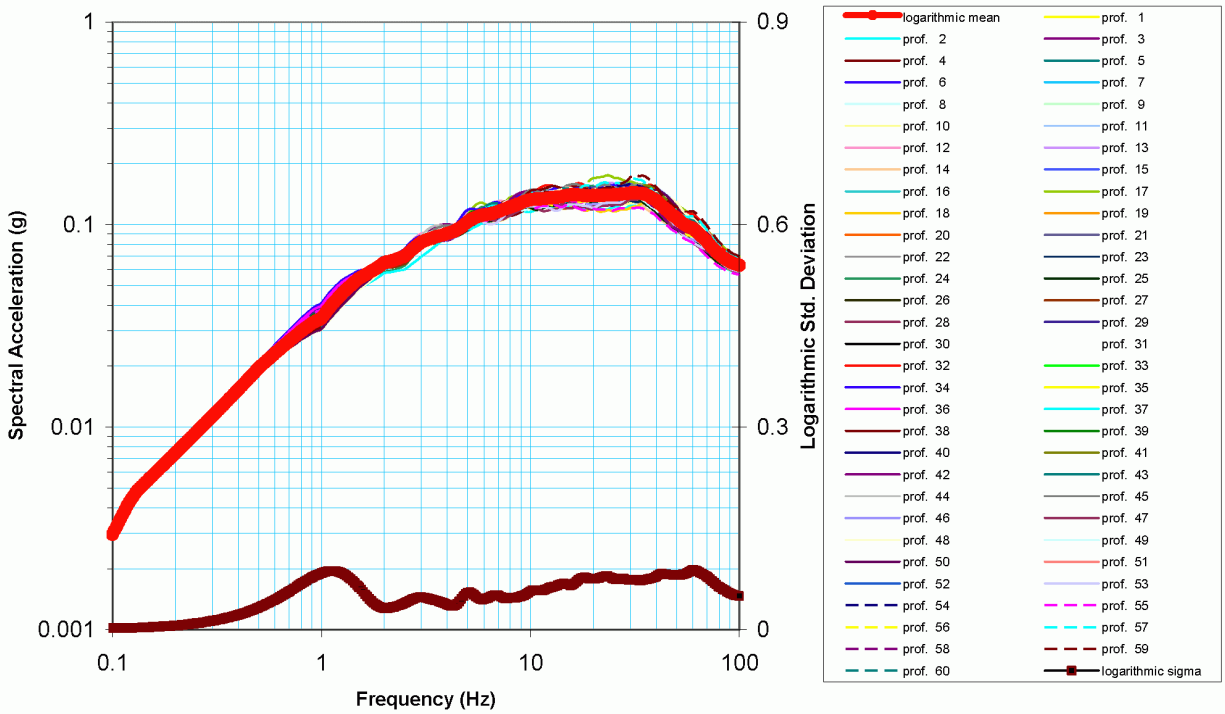


Figure 2.5-118—{Amplification Factor and Logarithmic Sigma at GMRS Elevation for 1E-4 LF Input Motion}

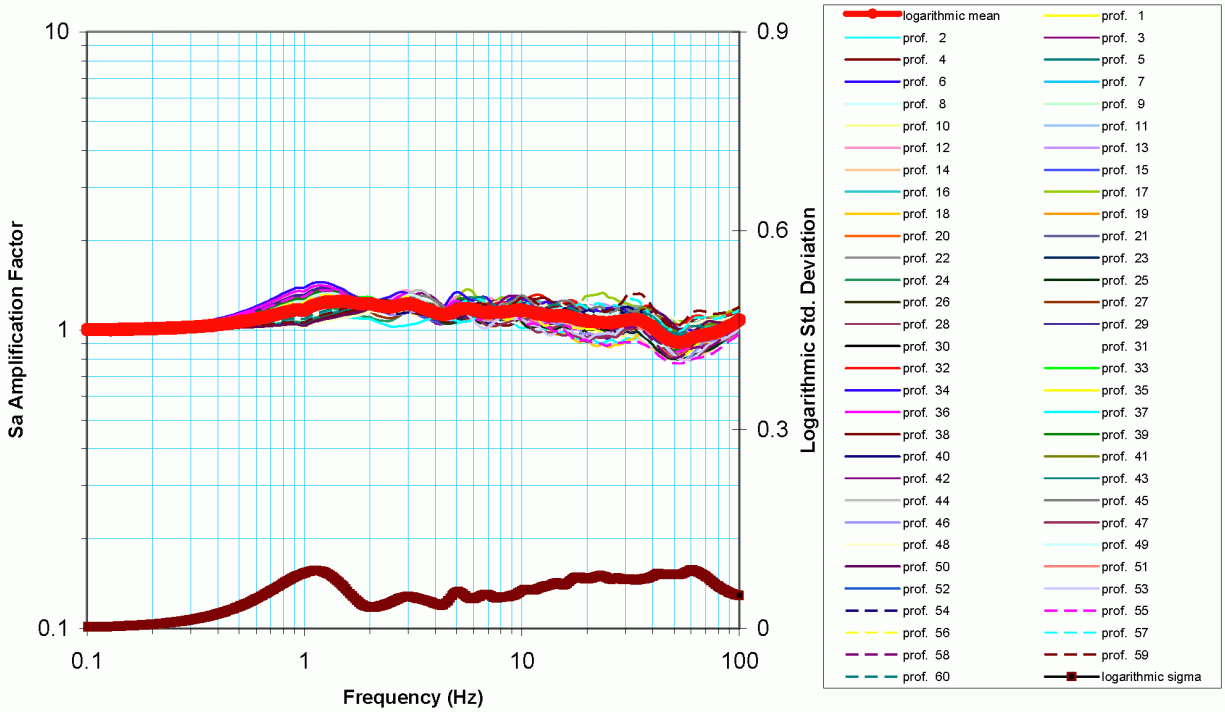


Figure 2.5-119—{Maximum Strain vs. Depth at GMRS Elevation for 1E-4 LF Input Motion}

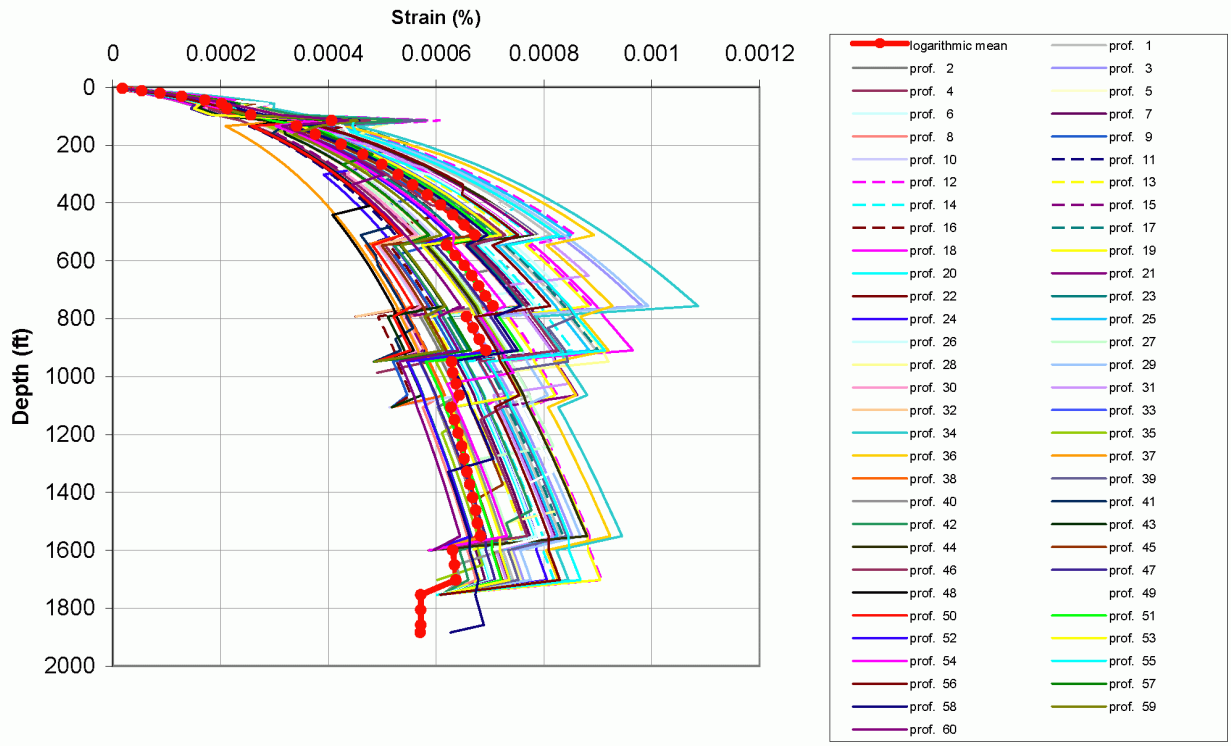


Figure 2.5-120—{Damping Ratio vs. Depth at GMRS Elevation for 1E-4 LF Input Motion}

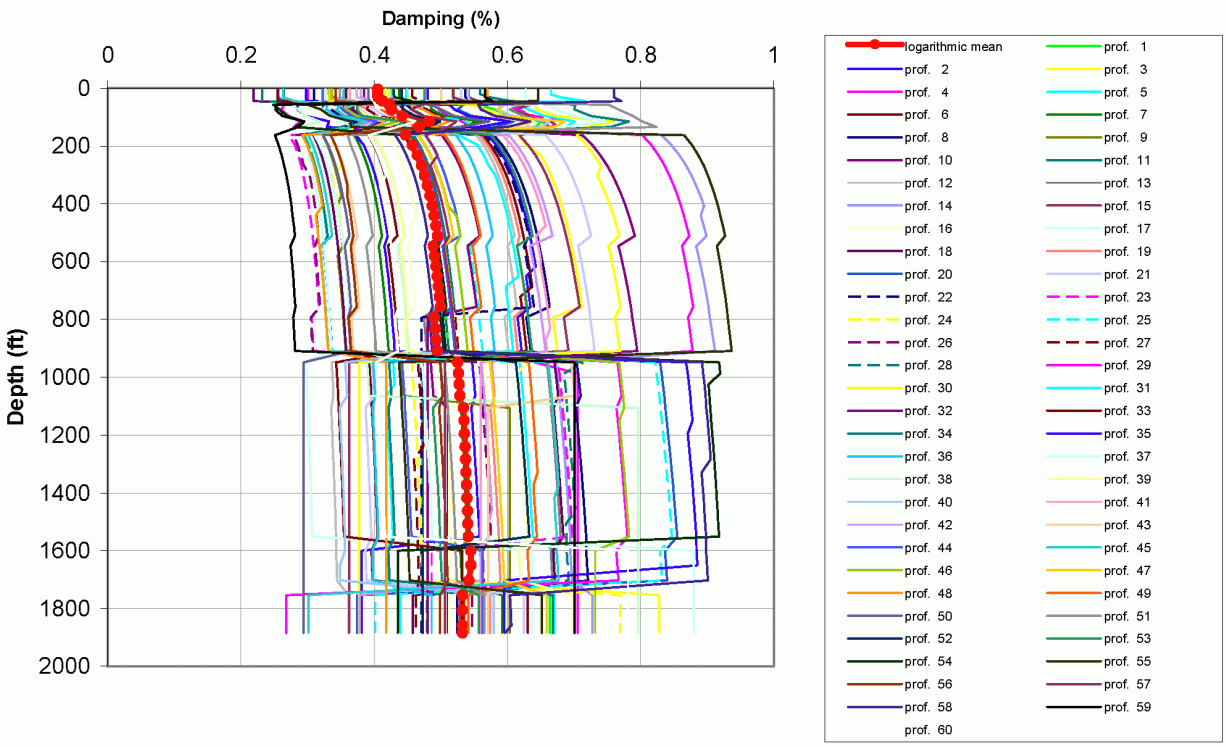


Figure 2.5-121—{Response Spectra and Logarithmic Sigma at GMRS Elevation for 1E-5 HF Input Motion}

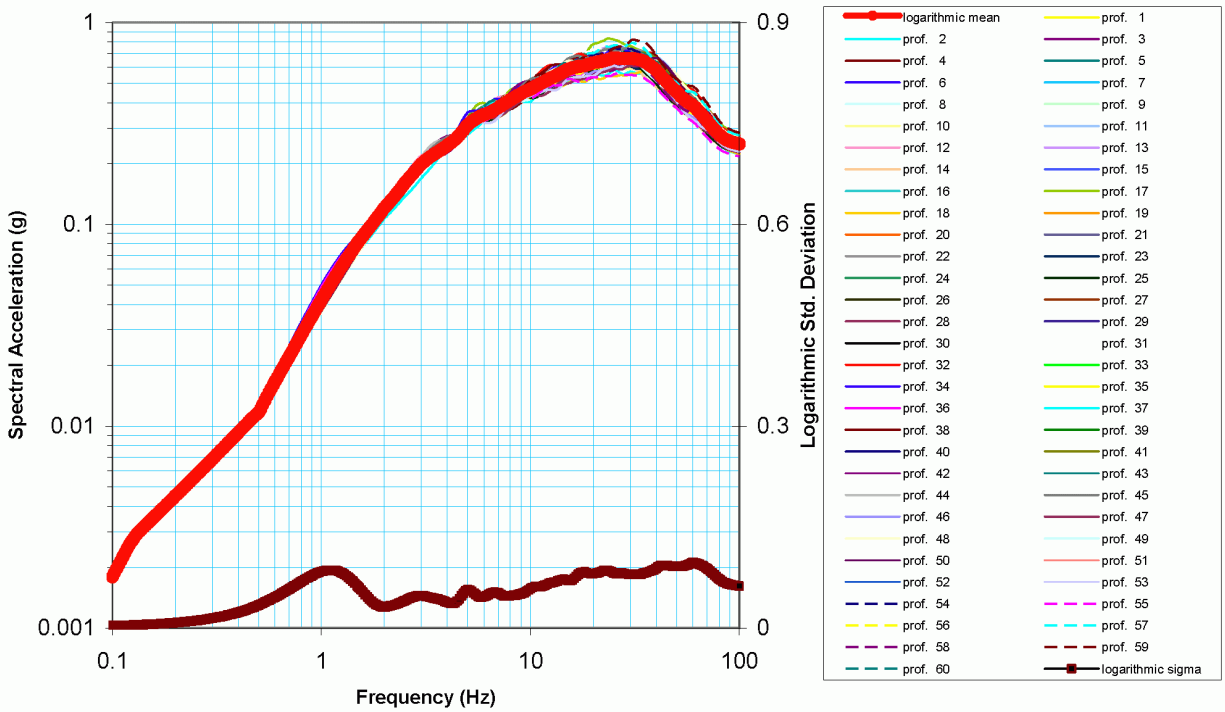


Figure 2.5-122—{Amplification Factor and Logarithmic Sigma at GMRS Elevation for 1E-5 HF Input Motion}

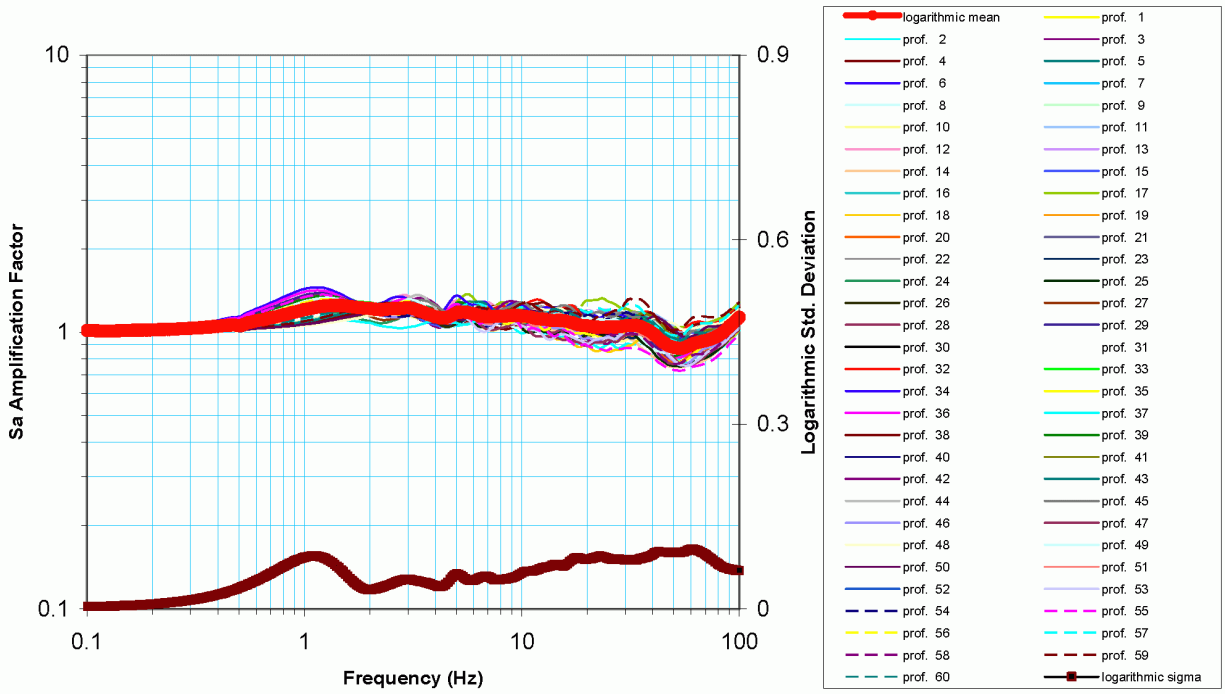


Figure 2.5-123—{Maximum Strain vs. Depth at GMRS Elevation for 1E-5 HF Input Motion}

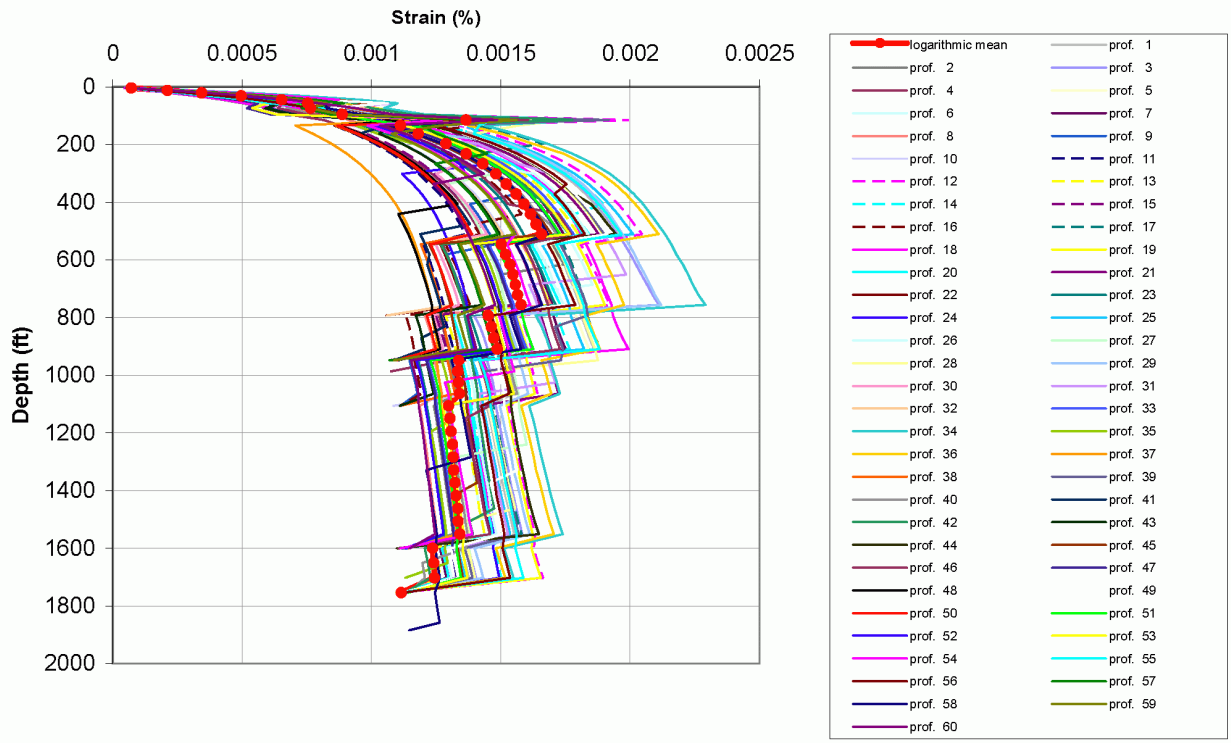


Figure 2.5-124—{Damping Ratio vs. Depth at GMRS Elevation for 1E-5 HF Input Motion}

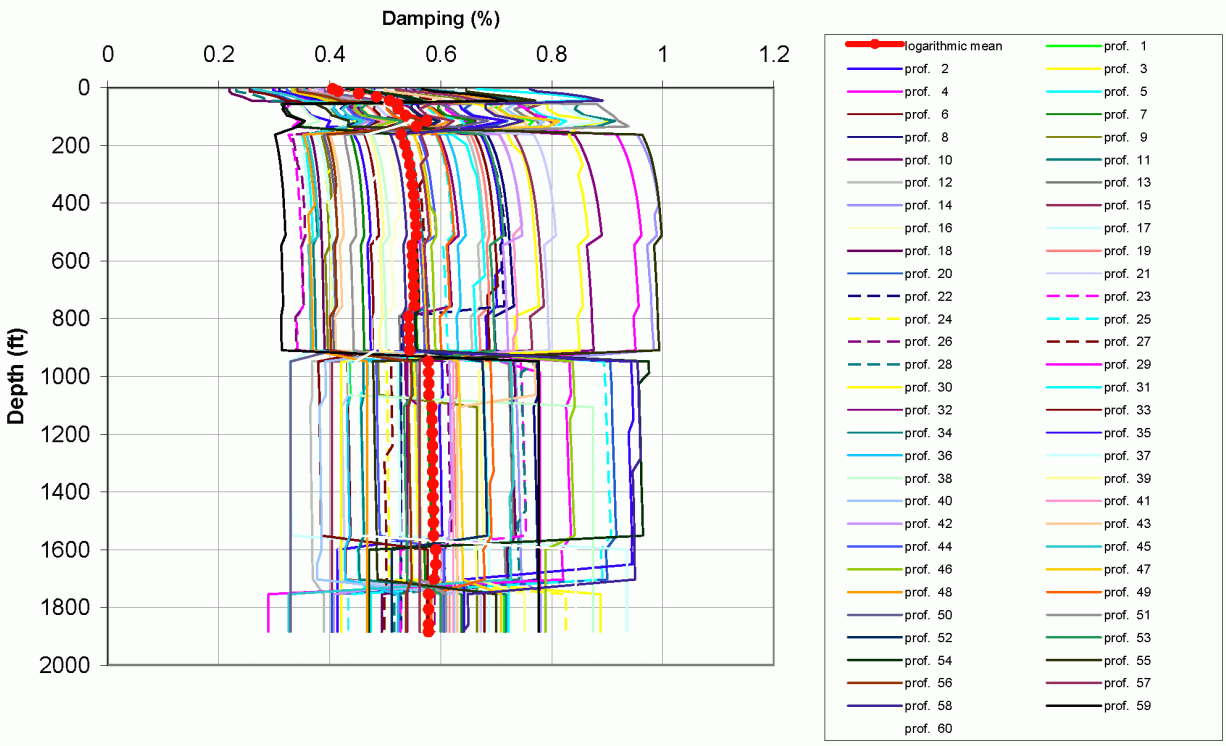


Figure 2.5-125—{Response Spectra and Logarithmic Sigma at GMRS Elevation for 1E-5 LF Input Motion}

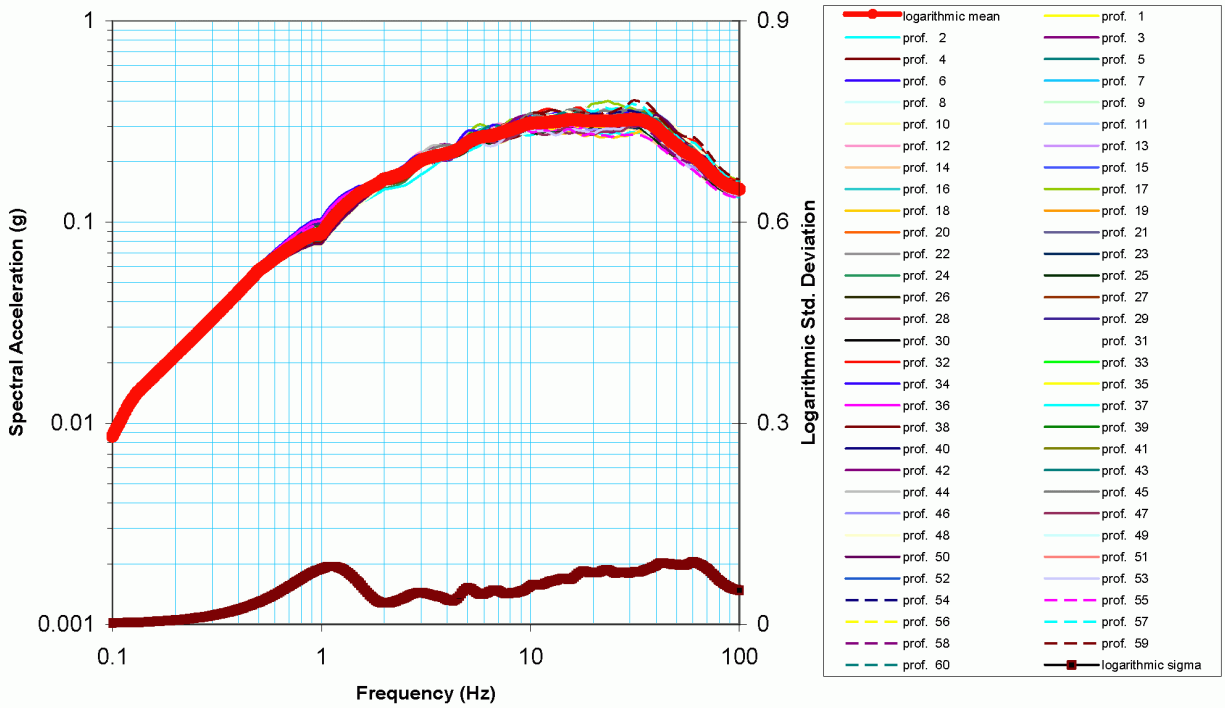


Figure 2.5-126—{Amplification Factor and Logarithmic Sigma at GMRS Elevation for 1E-5 LF Input Motion}

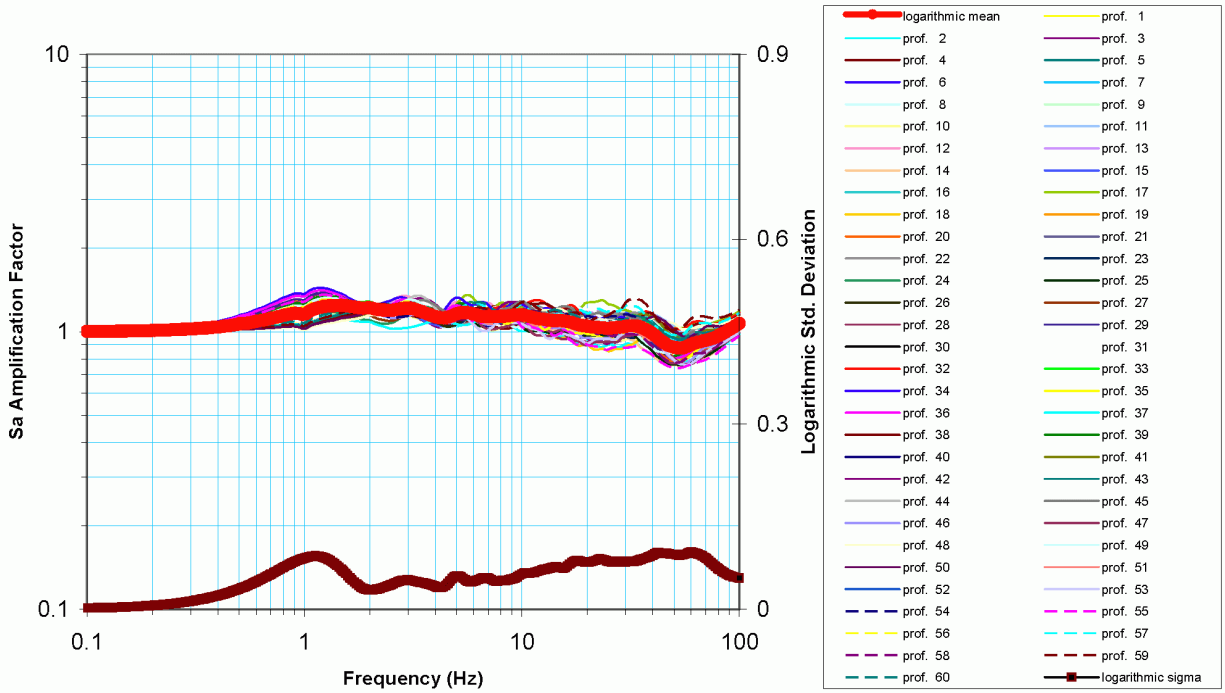


Figure 2.5-127—{Maximum Strain vs. Depth at GMRS Elevation for 1E-5 LF Input Motion}

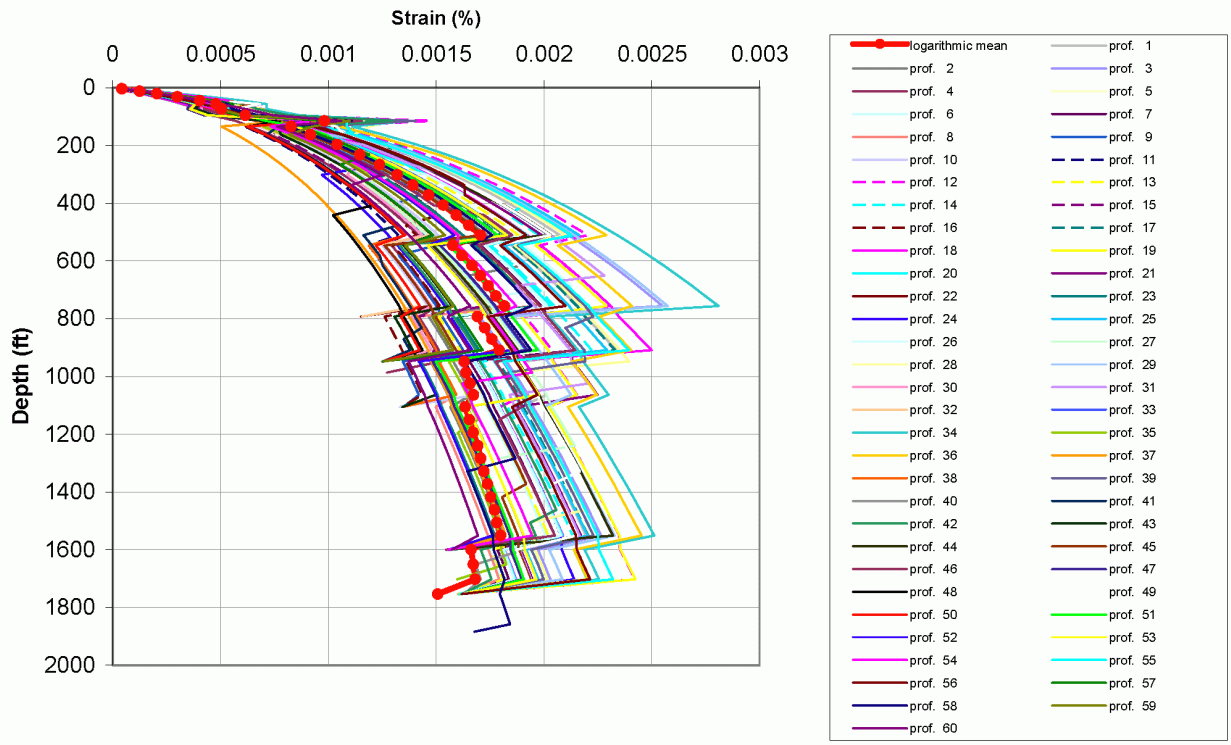


Figure 2.5-128—{Damping Ratio vs. Depth at GMRS Elevation for 1E-5 LF Input Motion}

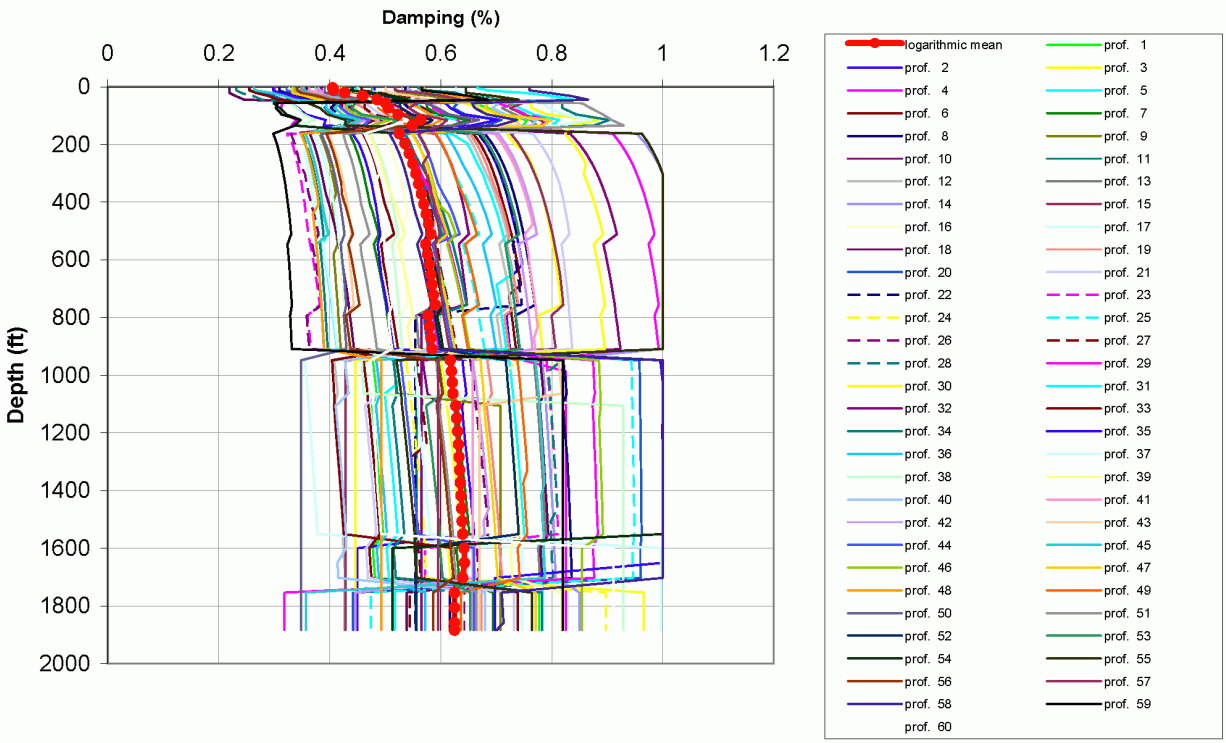


Figure 2.5-129—{Response Spectra and Logarithmic Sigma at GMRS Elevation for 1E-6 HF Input Motion}

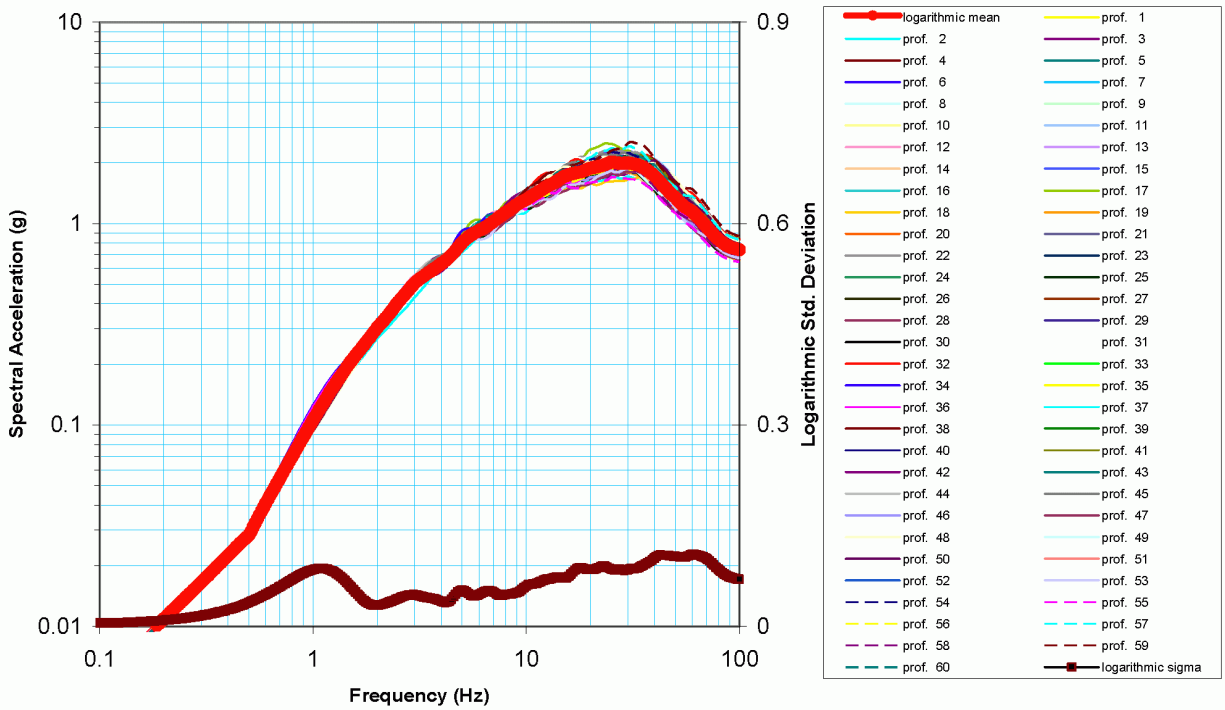


Figure 2.5-130—{Amplification Factor and Logarithmic Sigma at GMRS Elevation for 1E-6 HF Input Motion}

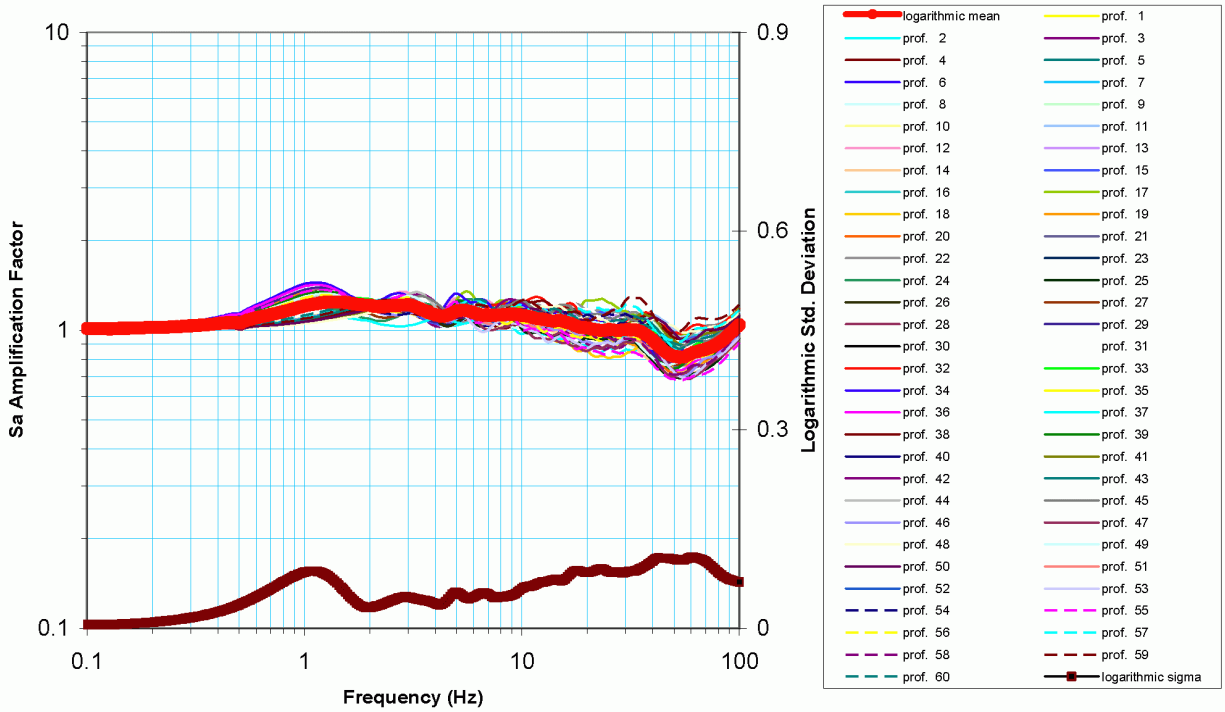


Figure 2.5-131—{Maximum Strain vs. Depth at GMRS Elevation for 1E-6 HF Input Motion}