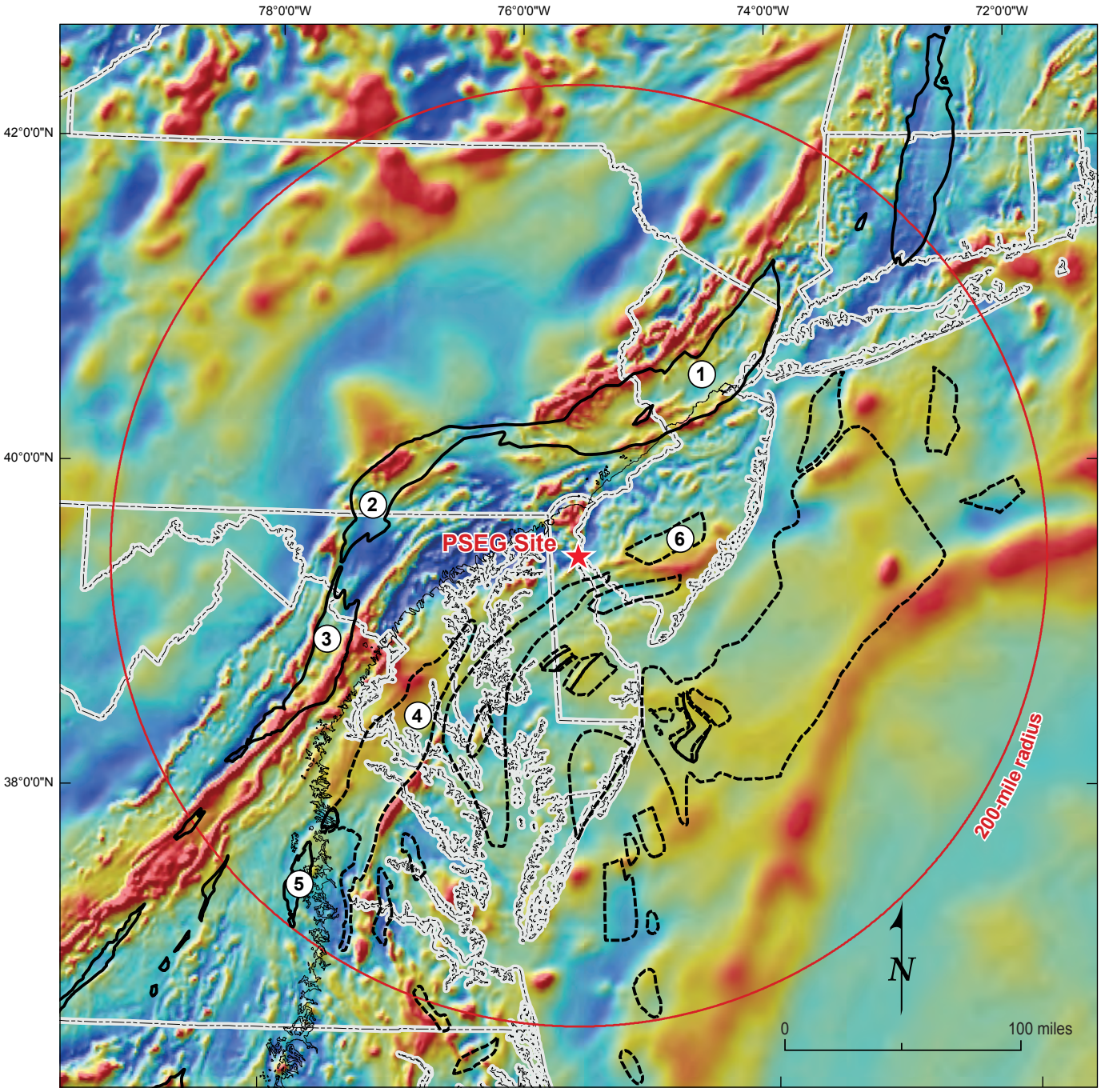

Projection: U.S. Contiguous Equidistant Conic

United States Nuclear Regulatory Commission Official Hearing Exhibit

In the Matter of:	PSEG POWER, LLC AND PSEG NUCLEAR, LLC (Early Site Permit Application)		
ASLBP #:	15-943-01-ESP-BD01		
Docket #:	05200043		
Exhibit #:	PSEG004H-MA-BD01	Identified:	03/24/2016
Admitted:	03/24/2016	Withdrawn:	
Rejected:		Stricken:	
Other:			

LEGEND

Coastal Plain boundary

Magnetic Field Data (Reference 2.5.1-138)

High : 2695.92 nanotesla (nT)

Low : -782.573 nanotesla (nT)

Mesozoic basins (Reference 2.5.1-15)

Exposed Covered

1. Newark Basin
2. Gettysburg Basin
3. Culpeper Basin
4. Taylorsville Basin
5. Richmond Basin
6. Buena Basin

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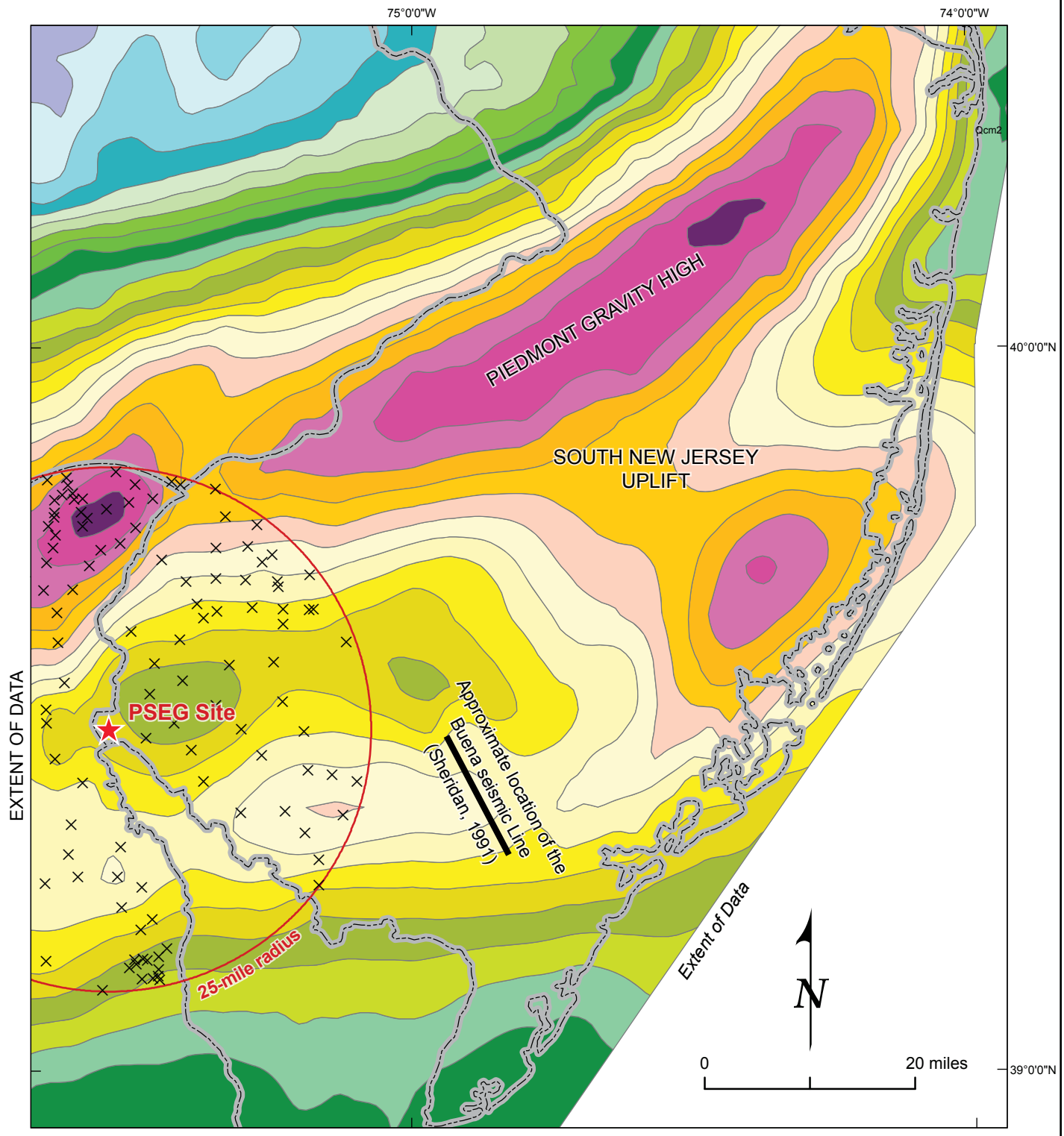
Site Region Magnetic Field with Mesozoic Basins

FIGURE 2.5.1-22c

Rev 0



LEGEND

× Gravity Station within 25-mile radius of site

Bouguer Gravity Anomaly

- 35 to 40 mgals
- 30 to 35 mgals
- 25 to 30 mgals
- 20 to 25 mgals
- 15 to 20 mgals
- 10 to 15 mgals
- 5 to 10 mgals
- 0 to 5 mgals
- -5 to 0 mgals
- -10 to -5 mgals
- -15 to -10 mgals
- -20 to -15 mgals
- -25 to -20 mgals
- -30 to -25 mgals
- -35 to -30 mgals
- -40 to -35 mgals
- -45 to -40 mgals
- -50 to -45 mgals
- -55 to -50 mgals
- -60 to -55 mgals
- -65 to -60 mgals
- -70 to -65 mgals

Projection: NAD 1983 UTM Zone18N
Gravity data from Ghatge, S.L., Reference 2.5.1-74

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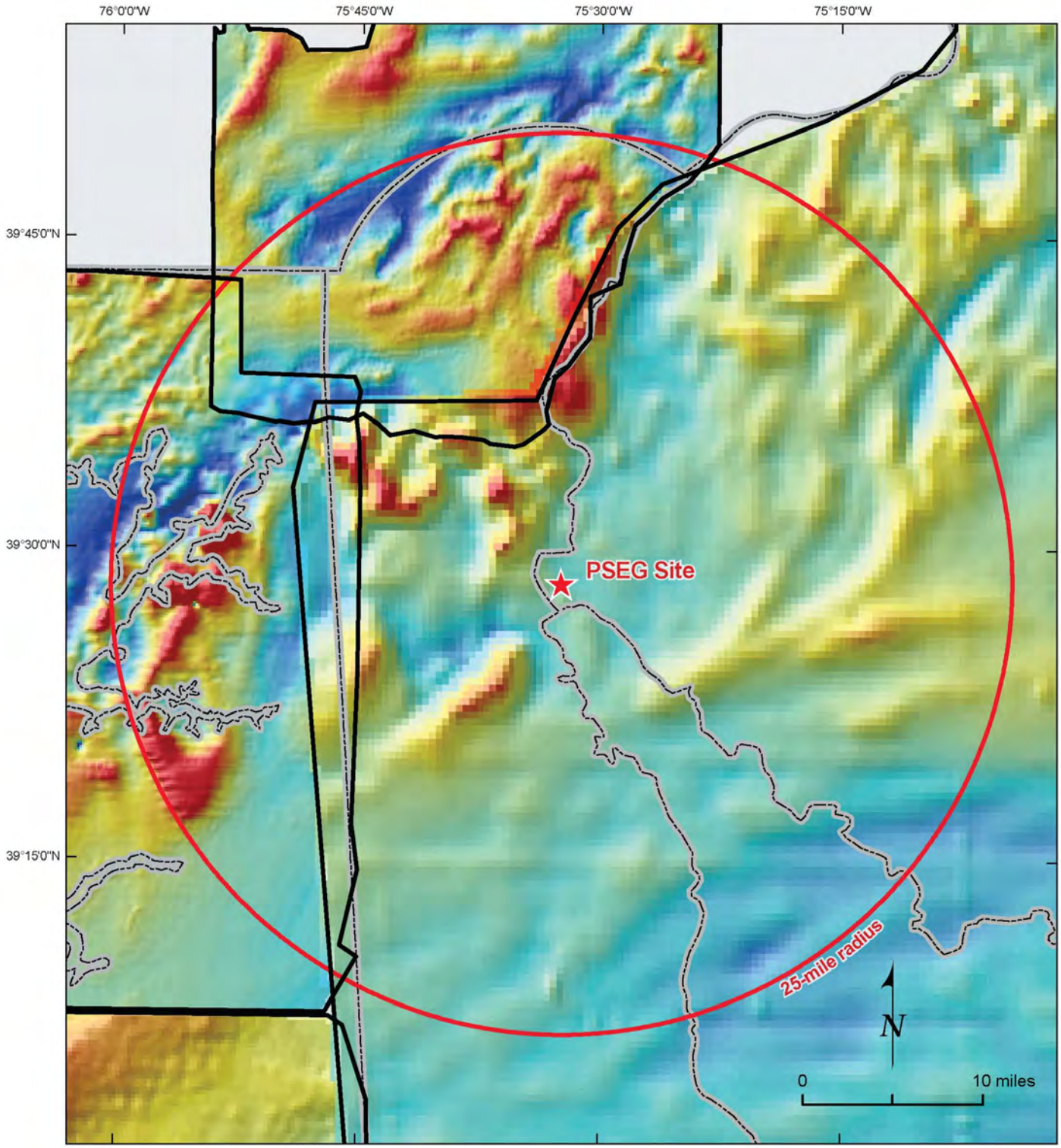
Site Vicinity Gravity Map

FIGURE 2.5.1-23

Rev 0



Projection: NAD 1983 UTM Zone18N

See Figure 2.5.1-24b for explanation and data sources

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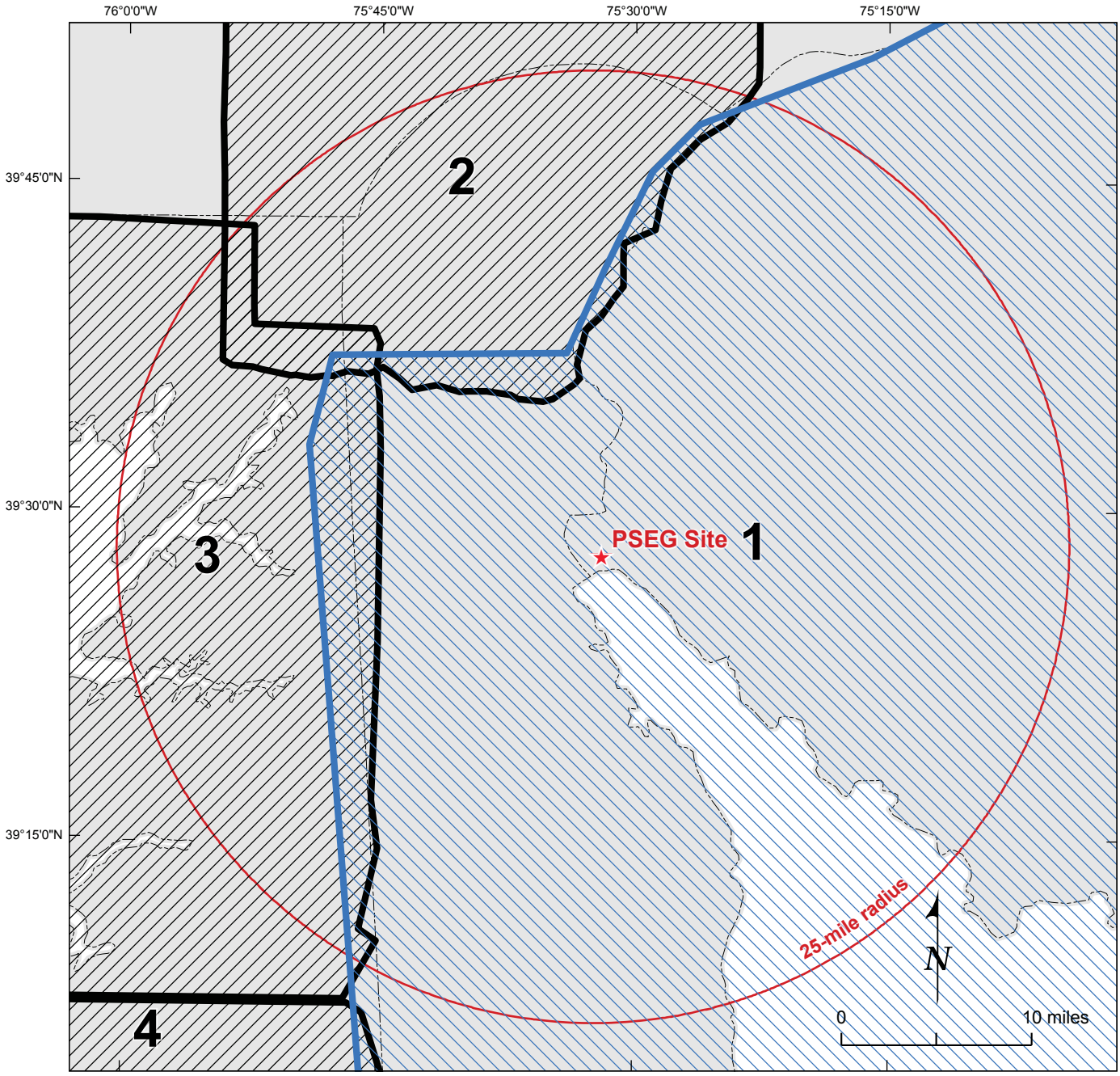
Site Vicinity Magnetic Anomaly Map

FIGURE 2.5.1-24a

Rev 0



Projection: NAD 1983 UTM Zone18N

LEGEND

1. *Reference 2.5.1-234*
   Spacing: 8 km
   Dir: E-W
   Altitude: 994 ft RA/1791 B
   High : 56717.5 nanotesla (nT)
   Low : 54974.7 nanotesla (nT)

2. *Reference 2.5.1-237*
   Spacing: 0.5 mi.
   Dir: N-S
   Altitude: 1000 AG
   High : 8967.07 nanotesla (nT)
   Low : 6718.82 nanotesla (nT)

3. *Reference 2.5.1-235*
   Spacing: 0.5 mi.
   Dir: E-W
   Altitude: 400 AG
   High : 11308 nanotesla (nT)
   Low : 6745 nanotesla (nT)

4. *Reference 2.5.1-236*
   Spacing: 1 mi.
   Dir: E-W
   Altitude: 1200 B
   High : 8018.76 nanotesla (nT)
   Low : 6987.26 nanotesla (nT)

1. Reference 2.5.1-234
2. Reference 2.5.1-237
3. Reference 2.5.1-235
4. Reference 2.5.1-236

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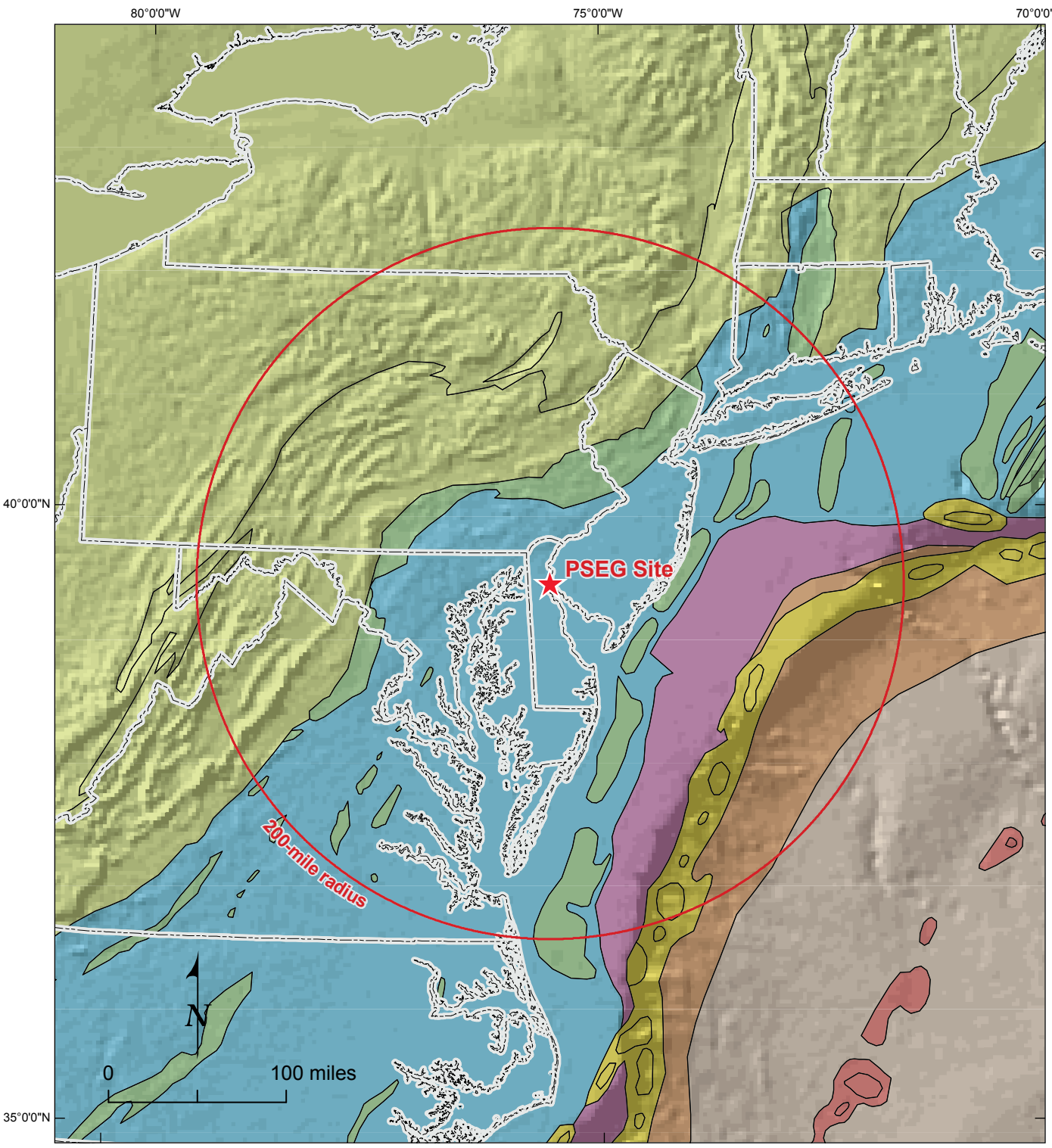
Site Vicinity Magnetic Anomaly Map Explanation

FIGURE 2.5.1-24b

Rev 0



Projection: U.S. Contiguous Equidistant Conic

LEGEND

Crustal Zones (Reference 2.5.1-206)

- Blake Spur Magnetic Anomaly
- Continental Crust
- East Coast Magnetic Anomaly
- Marginal Oceanic Crust
- Oceanic Crust
- Rift Basin
- Rift Stage Crust
- Rifted Continental Crust

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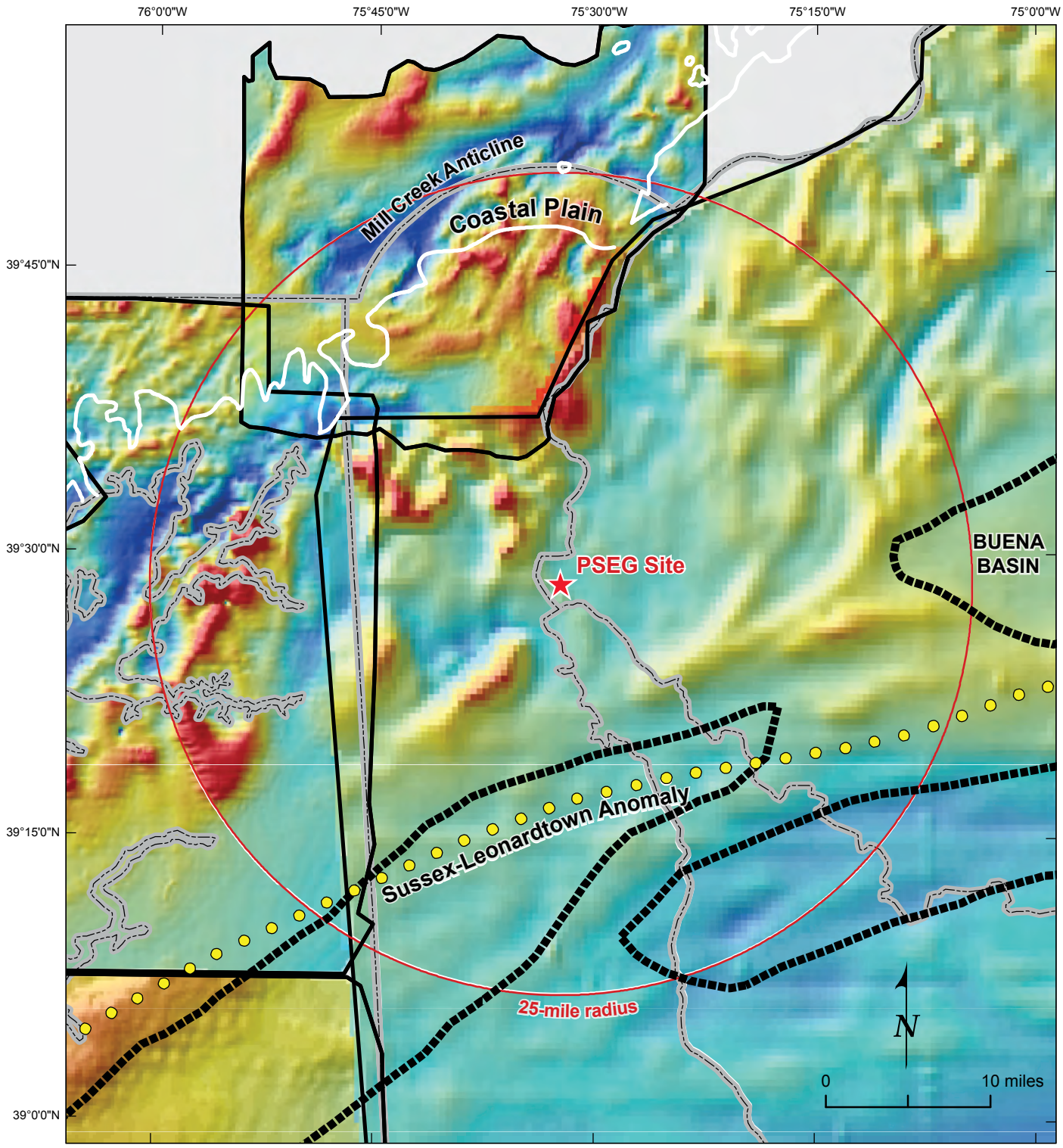
Site Region Crustal Zones

FIGURE 2.5.1-25

Rev 0



Projection: NAD 1983 UTM Zone18N

LEGEND

Mesozoic basins (Reference 2.5.1-15)

- Exposed
- Buried

For explanation of magnetic data see Figure 2.5.1-24b

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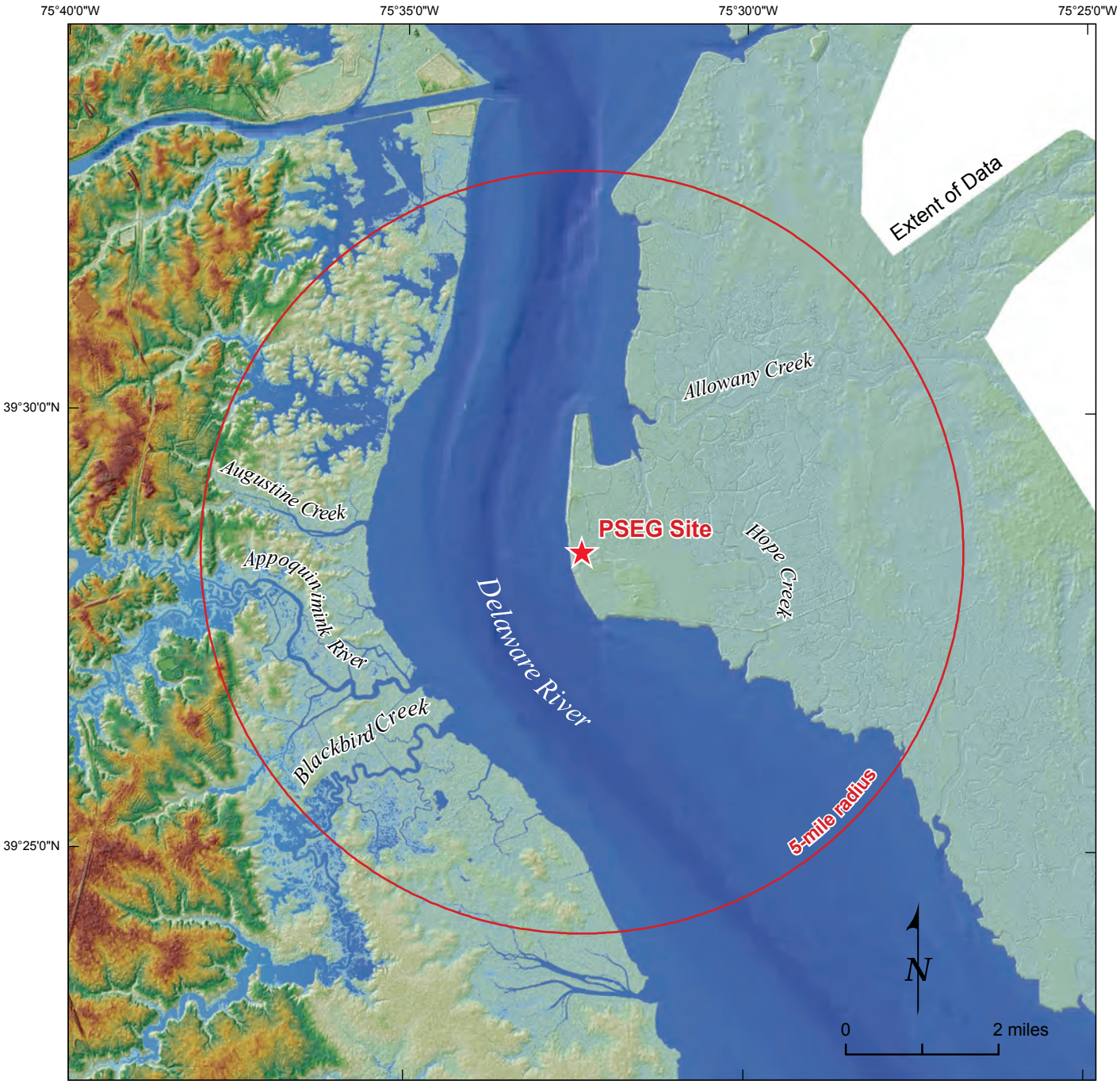
Site Vicinity Magnetic Anomaly Map Features

FIGURE 2.5.1-26

Rev 0



Projection: NAD 1983 UTM Zone 18N
New Jersey LIDAR from Reference 2.5.1-140

LEGEND

Elevation (feet)

0 - 1	29 - 33	58 - 61
1 - 4	33 - 37	61 - 65
4 - 8	37 - 41	65 - 69
8 - 13	41 - 45	69 - 73
13 - 17	45 - 49	73 - 76
17 - 21	49 - 52	76 - 80
21 - 25	52 - 55	80 - 83
25 - 29	55 - 58	83 - 87

Note: explanation shows only elevations above sea level

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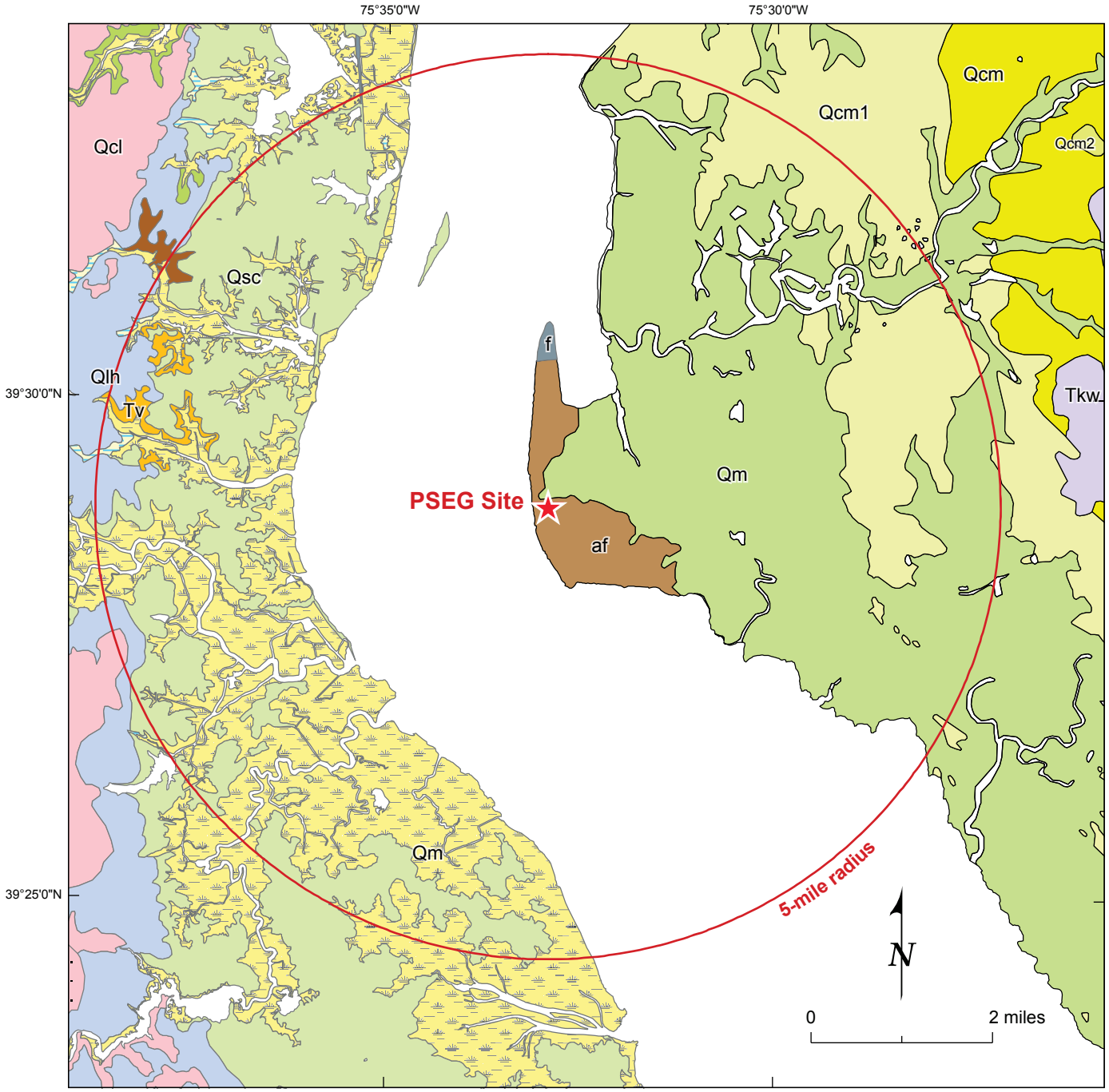
Site Area Topography
and Physiography

FIGURE 2.5.1-27

Rev 0



Projection: NAD 1983 UTM Zone 18N

LEGEND

Delaware Geology

- f — Fill
- Qsw — Swamp deposits
- Qm — Marsh deposits
- ud — Undrained depressions in Qcl
- Qcl — Columbia Formation
- Qsc — Scotts Corners Formation
- Qlh — Lynch Heights Formation
- Tv — Vincentown Formation
- KTht — Hornerstown Formation
- Kml — Mount Laurel Formation

New Jersey Geology

- af — Artificial fill
- Qm — Salt-marsh deposits
- Qcm1 — Cape May Formation, Unit 1
- Qcm2 — Cape May Formation, Unit 2
- Qcm — Cape May Formation, undivided
- Tkw — Kirkwood Formation

Delaware geology from Reference 2.5.1-181
New Jersey geology from Reference 2.5.1-144

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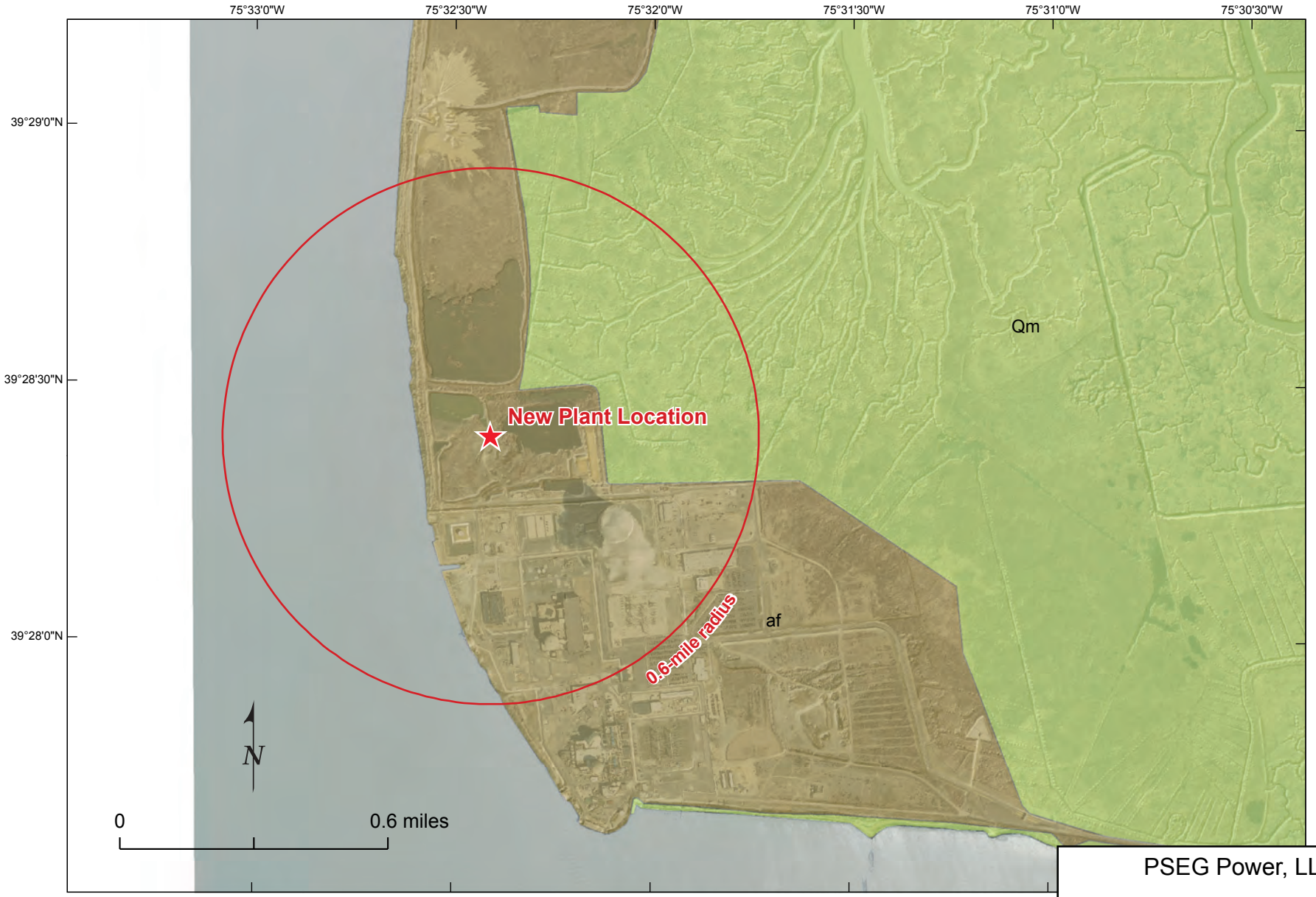
Site Area Geologic Map

FIGURE 2.5.1-28

Rev 0



LEGEND

- af — Artificial fill
- Qm — Salt marsh deposits

Geologic contact between Qm and af determined by elevation data;
Qm defined as elevations less than +6 feet Mean Sea Level

Projection: NAD 1983 UTM Zone 18 N

2007 air photos from Reference 2.5.1-143
Geology modified from Reference 2.5.1-144

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New Plant Location Geology

FIGURE 2.5.1-29

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Projection: NAD 1983 UTM Zone 18 N

2007 imagery from Reference 2.5.1-143

N

0 0.4 miles

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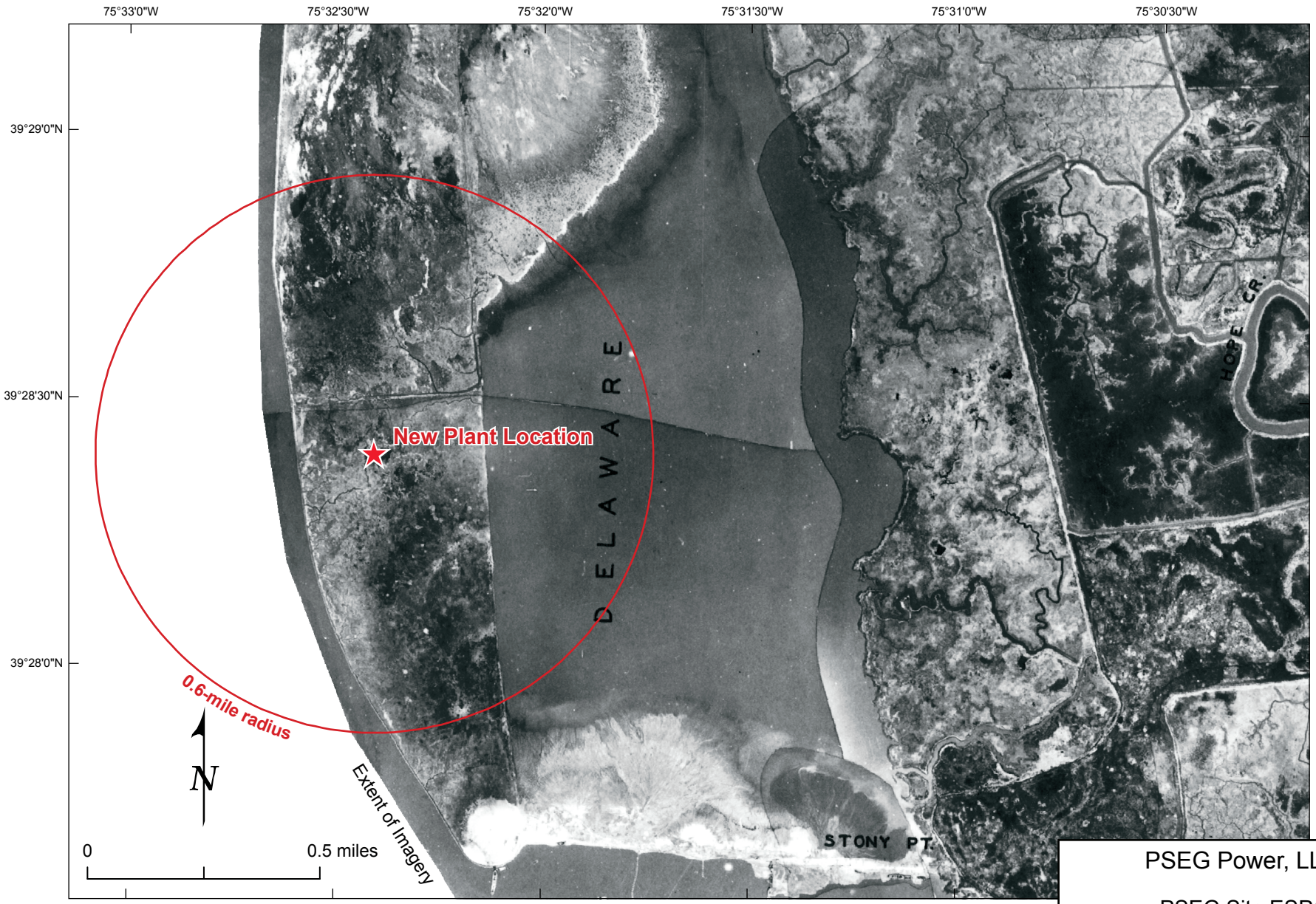
New Plant Location
Aerial Photography

FIGURE 2.5.1-30

Rev 0



1930's imagery from Reference 2.5.1-142

Note: As stated in the metadata: "The digital product has not been corrected for distortion or vertical displacement. This data does not meet National Standard for Spatial Data Accuracy (NSSDA)."

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Site Location Historical Aerial Photography

FIGURE 2.5.1-31

Rev 0

Projection: NAD 1983 UTM Zone 18 N
New Jersey LIDAR from Rederence 2.5.1-140

LEGEND

Elevation (feet)

< 0.0	10.0 - 11.9
0 - 1.9	12.0 - 13.9
2.0 - 3.9	14.0 - 15.9
4.0 - 5.9	16.0 - 17.9
6.0 - 7.9	18.0 - 19.9
8.0 - 9.9	> 20.0

N

0 0.5 mi

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Site Topography

FIGURE 2.5.1-32

Rev 0

			Formation/Unit			Primary Lithologies		Geologic Conditions	Unit Thickness	Occurrence in Site Area
CENOZOIC	Quaternary	Holocene	Quaternary Marsh deposits			muck and peat; silt, sand and clay		aggradation of Delaware Bay estuary	variable thickness	present over most of the site area in low lying areas
			~~ unconformity ~~~~~~~~~~							
		Pleistocene	DELAWARE		NEW JERSEY	estuarine terrace deposits with coarse to fine sand and pebbles with concentrations of heavy minerals; peat; isolated fluvial deposits?		transgressive and regressive cycles	variable thickness	outcrops in eastern and western portions of the site area
			Delaware Bay Group	Scotts Corners Formation	Cape May Formation					
				~~ unconformity ~~						
				Lynch Heights Formation						
			~~ unconformity ~~~~~~~~~~					regression and erosion		
		Upper Tertiary (Miocene)	Kirkwood Formation			clay silt and sand deposited in two or three marine cycles		polycyclic transgression and regression phases	90 feet at southern portions of site area; pinches out northward	subcrop only
			~~ unconformity ~~~~~~~~~~					regression and erosion		
		Lower Tertiary	Shark River Formation			glauconitic sand and mudstone		low sediment input	70 feet (Reference 2.5.1-17)	subcrop only
			~~ unconformity ~~~~~~~~~~					regression and erosion		
			Manasquan Formation			lower glauconitic member; upper clayey sand to silt member		low sediment input and bioturbation	40 feet (Reference 2.5.1-17)	subcrop only
			~~ unconformity ~~~~~~~~~~					regression and erosion		
			Vincentown Formation			quartz sand to quartz-rich calcareous sand with bryozoians and foraminifera		low sediment input and extreme bioturbation	90 feet (Reference 2.5.1-17)	outcrops in NW site area
			Hornerstown Formation			highly glauconitic sand with distinctive green color			30 feet (Reference 2.5.1-17)	
MESOZOIC	Cretaceous	Upper Cretaceous	Navesink			fossiliferous, clayey glauconitic sand		transgression to midshelf conditions	20 feet (Reference 2.5.1-17)	subcrop only
			Mount Laurel Formation			thinly bedded clays and sands with cross-bedding; thin pebbly sands		regressive pulse; low sediment input	100 feet (Reference 2.5.1-17)	subsurface only
			Wenonah Formation			clayey, silty, slightly glauconitic fine sand				
			Marshalltown Formation			intensely burrowed, very silty fine sand with glauconite		transgression; low sediment input	20 feet (Reference 2.5.1-17)	
			Englishtown Formation			micaceous silt to very fine sand		regressive pulse	25 feet (Reference 2.5.1-17)	
			Woodbury Formation			micaceous, chloritic, silty clay				
			Merchantville Formation			glauconitic sand to micaceous silty clay		transgression and establishment of widespread marine conditions; low sediment rates	120 feet (Reference 2.5.1-17)	
			Magothy Formation			beach and estuarine deposits of cross-bedded sand, with clay and silt layers; some lignite		transition to marine conditions	50 feet, pinches out north of site location (Reference 2.5.1-17)	
			~~ unconformity ~~~~~~~~~~					regression and erosion		
		Lower Cretaceous	Potomac Group (Formation)			white, gray and red interbedded silts, clays, and quartose sand		aggrading alluvial plain; thermal subsidence	800 to 1650 feet (Reference 2.5.1-17)	
			~~ pre-Cretaceous unconformity ~~~~~~~~~~					uplift and erosion		
	Triassic	Upper Triassic	**Basement Complex**					Amalgamation of Pangea followed by rifting to form North America	undetermined	
			Triassic Basin?			Fanglomerates and lacustrine sediments; diabase volcanics				
PRECAMBRIAN? PALEOZOIC?	Proterozoic? Paleozoic?	NeoProterozoic to Silurian?	Carolina Superterrane?	Philadelphia Terrane?		meta mafic to felsic plutons and volcanics with sediments, and ultramafic components	aluminous to quartz-rich schist with interbedded amphibolites (Wissahickon Formation) with ultramafic components; Wilimington Complex felsic to mafic arc complex			

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Site Area Stratigraphy

FIGURE 2.5.1-33

Rev 0

		Formation/Unit	Lithologies	Thickness
QUATERNARY	Holocene (recent)	Artificial fill	clays, silts, and sands of various proportions along with clayey and silty gravels	4.1 ± 5.1 feet
		Hydraulic fill	soft clayey silts, sandy silts and organic clays	33.5 ± 12.3 feet
	Pleistocene	Alluvium	fine to coarse sand and gravel; peat and organic rich soils; silt and clay near base	12.7 ± 12.3 feet
		~~ unconformity ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		
TERTIARY	Upper Tertiary (Neogene)	Kirkwood Formation	*Upper member:* greenish-gray, silty, fine sand, fine sand and greenish-gray to brown organic clay with organic material and shell fragments; *Lower member:* fine to coarse sand and gravel with variable amounts of silt and clay	*Upper member:* 14.5 ± 7.7 feet; *Lower member:* 7.2 ± 7.8 feet
		~~ unconformity ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		
	Lower Tertiary (Paleogene)	Vincentown Formation	greenish-gray, fine to medium grained silty sand with some zones of clayey sand; variably glauconitic; cemented zones	52.0 ± 26.1 feet
		Hornerstown Formation	greenish-gray to dark green silty and clayey quartz and glauconitic sand with indurated zones	18.6 ± 3.2 feet
CRETACEOUS	Upper Cretaceous	Navesink Formation	fossiliferous, dark green to greenish-black glauconitic sand; pelecypod fragments	24.3 ± 2.3 feet
		Mount Laurel Formation	brownish gray to dark green, fine to coarse grained sand; variable amounts of silt and clay; coarsening upward sequence	10.3 ± 3.5 feet
		Wenonah Formation	sandy clay with clayey sand	15 feet
		Marshalltown Formation	glauconitic, silty and clayey fine sand	25 feet
		Englishtown Formation	dark gray to black sandy clay to clayey sand with shell fragments grades to black silt with trace amounts of mica and glauconite	44 feet
		Woodbury Formation	black, micaceous clay	36 feet
		Merchantville Formation	dark greenish-black glauconitic silts and clays with variable amounts of sand	30 feet
		Magothy Formation	interbeds of gray to dark gray, locally mottled silts and clays that are interbedded with sands; trace amounts of lignite and carbonaceous material	52 feet
		~~ unconformity ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		
	Lower Cretaceous	Potomac Group (Formation)	red, gray, and white mottled clay	1300 feet (Reference 2.5.1-17) PSEG No. 6 Production Well
		~~ pre-Cretaceous unconformity ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		
PRECAMBRIAN TO PALEOZOIC	NeoProterozoic to Paleozoic	**Basement Complex**		
		Philadelphia Terrane	Wissahickon Schist – reported as residual clay (PSEG No. 6 Production Well)	undetermined

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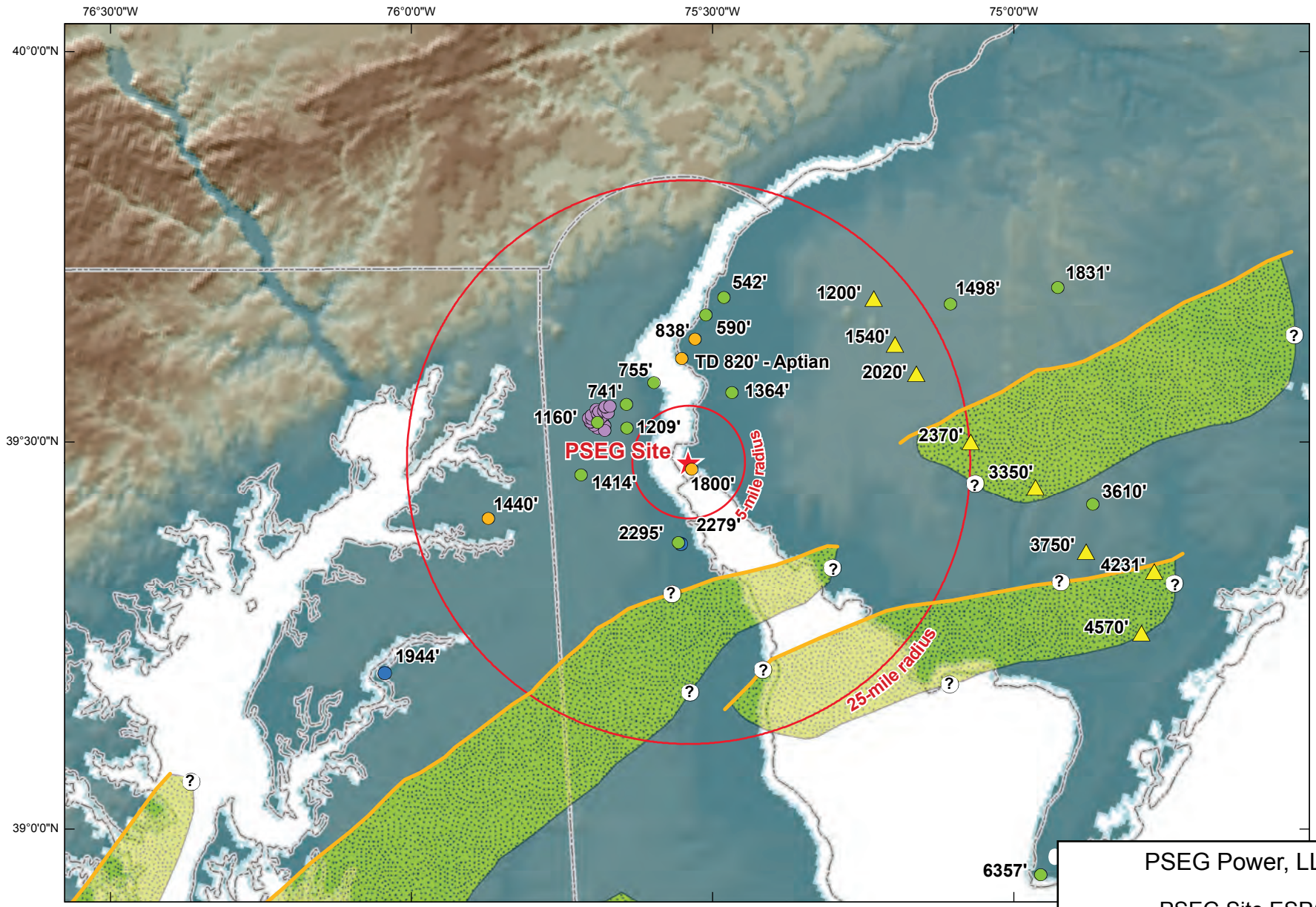
Site Location Stratigraphy

FIGURE 2.5.1-34

Rev 0



LEGEND

- Seismic refraction point, Volkert (Reference 2.5.1-244)
- Boring, Volkert (Reference 2.5.1-244)
- Well, Benson (Reference 2.5.1-18)
- Well, Hansen (Reference 2.5.1-79)
- Well, Summit Site (Reference 2.5.1-56)

Mesozoic Basins and Faults (Reference 2.5.1-15)

- Questionable location
- Faults
- Covered Basin

N

0 — 20 miles

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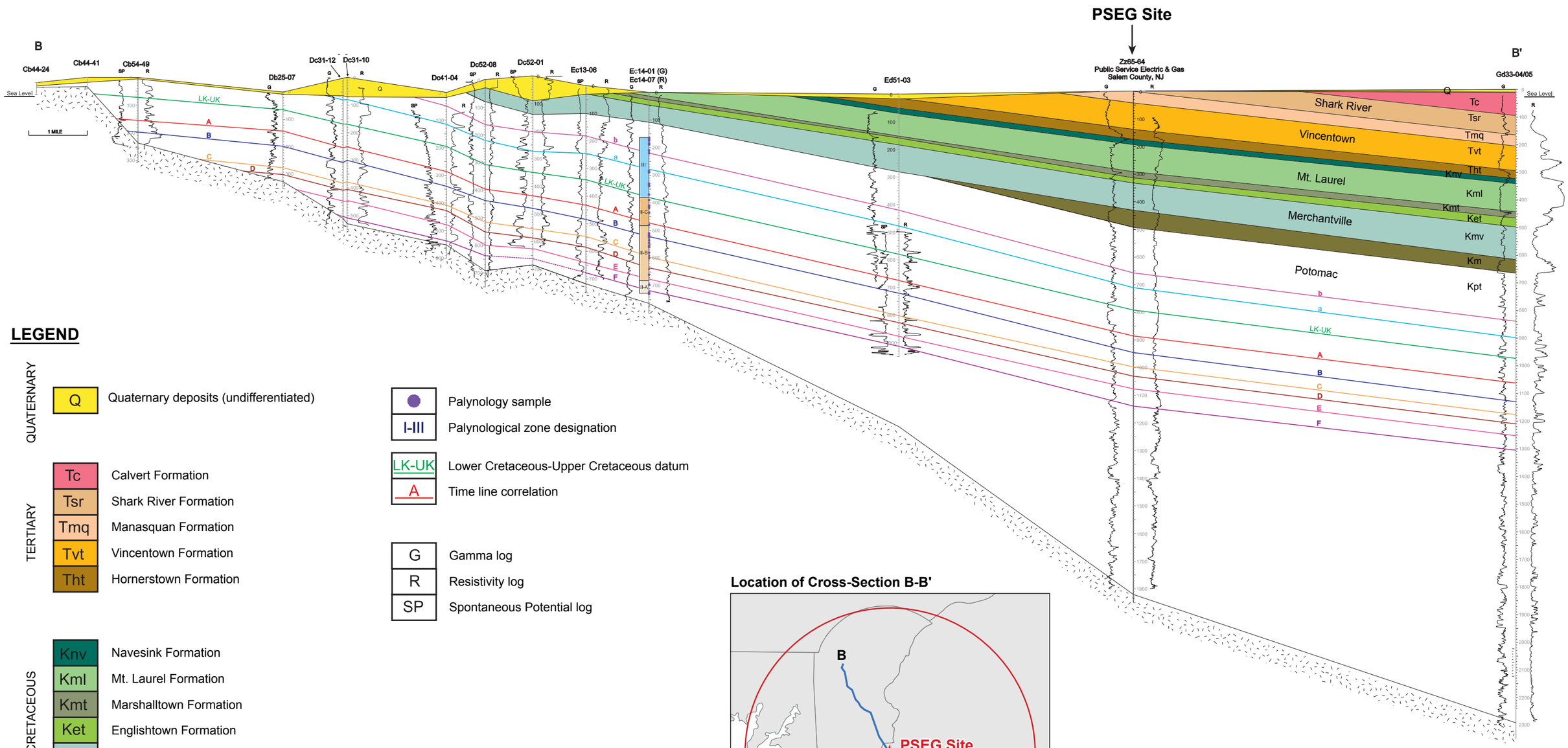
Depth to Basement

FIGURE 2.5.1-35

Rev 0



LEGEND

QUATERNARY

- Q — Quaternary deposits (undifferentiated)

TERTIARY

- Tc — Calvert Formation
- Tsr — Shark River Formation
- Tmq — Manasquan Formation
- Tvt — Vincentown Formation
- Tht — Hornerstown Formation

CRETACEOUS

- Knv — Navesink Formation
- Kml — Mt. Laurel Formation
- Kmt — Marshalltown Formation
- Ket — Englishtown Formation
- Kmv — Merchantville Formation
- Km — Magothy Formation
- Kpt — Potomac Formation

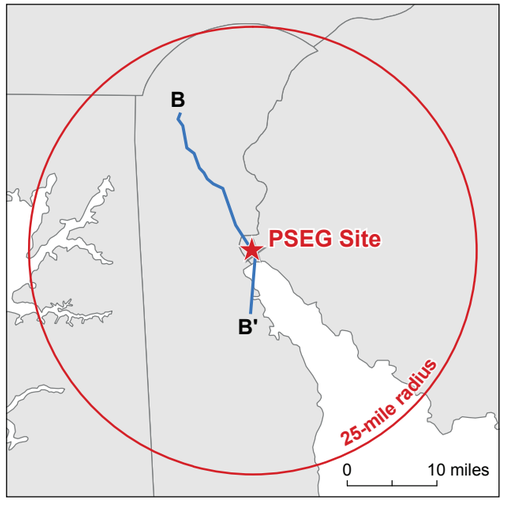
PZ–PRE CAMBRIAN

- Basement

- Palynology sample
- I-III — Palynological zone designation
- LK-UK — Lower Cretaceous-Upper Cretaceous datum
- A — Time line correlation

- G — Gamma log
- R — Resistivity log
- SP — Spontaneous Potential log

Location of Cross-Section B-B'



Reference 2.5.1-18

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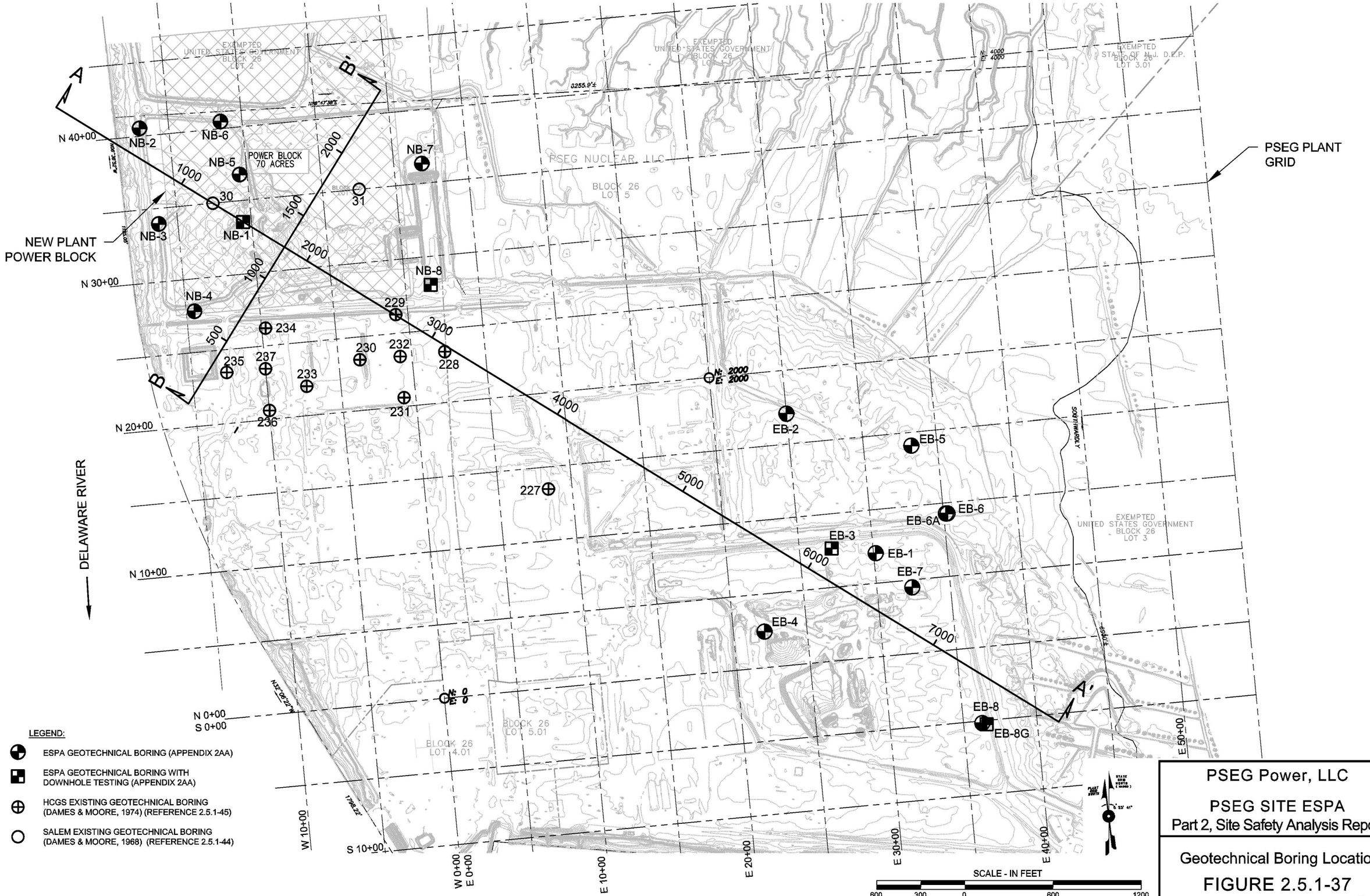
Site Vicinity Cross-Section

FIGURE 2.5.1-36

Rev 0



LEGEND:

- ESPA GEOTECHNICAL BORING (APPENDIX 2AA)
- ESPA GEOTECHNICAL BORING WITH DOWNHOLE TESTING (APPENDIX 2AA)
- HCGS EXISTING GEOTECHNICAL BORING (DAMES & MOORE, 1974) (REFERENCE 2.5.1-45)
- SALEM EXISTING GEOTECHNICAL BORING (DAMES & MOORE, 1968) (REFERENCE 2.5.1-44)

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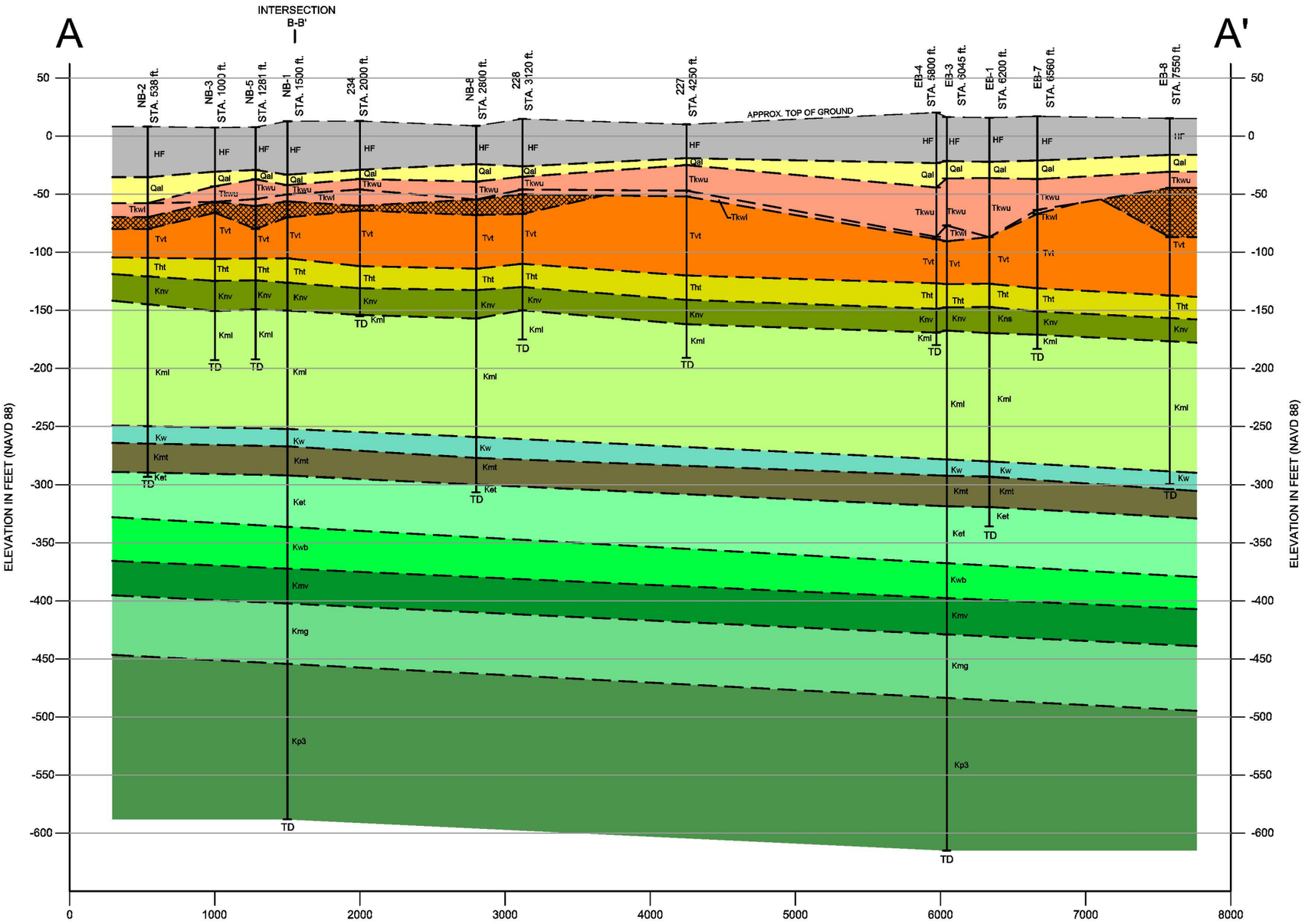
Geotechnical Boring Location

FIGURE 2.5.1-37

Rev 0

NW

SE



LEGEND:

- HF - Artificial and Hydraulic Fill
- Qal - Alluvium
- Tkwu - Kirkwood Formation (Upper)
- Tkwl - Kirkwood Formation (Lower)
- Tvt - Vincentown Formation (Oxidized)
- Tvt - Vincentown Formation
- Tht - Hornerstown Formation
- Knv - Navesink Formation
- Kml - Mount Laurel Formation
- Kw - Wenonah Formation
- Kmt - Marshalltown Formation
- Ket - Englishtown Formation
- Kwb - Woodbury Formation
- Kmv - Merchantville Formation
- Kmg - Magothy Formation
- Kp3 - Potomac Formation

VERTICAL SCALE - IN FEET

100 50 0 100 200

HORIZONTAL SCALE - IN FEET

800 400 0 800 1600

NOTES:

- BORINGS 227, 228, AND 234 (DAMES & MOORE, 1974) (REFERENCE 2.5.1-45)
- EB AND NB SERIES BORINGS COMPLETED FOR ESPA (APPENDIX 2AA)
- TD = TERMINATION DEPTH
- SEE FIGURE 2.5.1-37 FOR SECTION LOCATION.
- BORINGS PROJECTED ORTHOGONALLY TO SECTION LINE.
- SOME BORINGS SHOWN ON FIG-2.5.1-37 NOT INCLUDED DUE TO SHALLOW DEPTH OR PROXIMITY TO OTHER BORINGS.

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Cross-Section A-A'

FIGURE 2.5.1-38 Rev 0

SW B

B' NE

INTERSECTION A-A'

235 STA. 318 ft.

NB-4 STA. 556 ft.

234 STA. 712 ft.

NB-1 STA. 1248 ft.

NB-5 STA. 1512 ft.

31 STA. 1851 ft.

NB-7 STA. 2223 ft.

APPROX. TOP OF GROUND

ELEVATION IN FEET (NAVD 88)

25
0
-50
-100
-150
-200
-225

HF
Qal
Tkwu
Tkwl
Tvt
Tht
Knv
Kml

TD

BORING NB-1 TERMINATED AT ELEV. -588.1 ft., STRATIGRAPHY BELOW ELEV. -210 ft NOT SHOWN (SEE SECTION A-A')

0 500 1000 1500 2000 2500

STATIONING IN FEET

VERTICAL SCALE - IN FEET

30 15 0 30 60

HORIZONTAL SCALE - IN FEET

200 100 0 200 400

NOTES:

- BORING 31 (DAMES & MOORE, 1968) (REFERENCE 2.5.1-44)
- BORINGS 234 AND 235 (DAMES & MOORE, 1974) (REFERENCE 2.5.1-45)
- EB AND NB SERIES BORINGS COMPLETED FOR ESPA (APPENDIX 2AA)
- TD = TERMINATION DEPTH

NOTES (continued):

- SEE FIGURE 2.5.1-37 FOR SECTION LOCATION
- BORINGS PROJECTED ORTHOGONALLY TO SECTION LINE.
- SOME BORINGS SHOWN ON FIG-2.5.1-37 NOT INCLUDED DUE TO SHALLOW DEPTH OR PROXIMITY TO OTHER BORINGS.

LEGEND:

- HF - Artificial and Hydraulic Fill
- Qal - Alluvium
- Tkwu - Kirkwood Formation (Upper)
- Tkwl - Kirkwood Formation (Lower)
- Tvt - Vincentown Formation (Oxidized)
- Tvt - Vincentown Formation
- Tht - Hornerstown Formation
- Knv - Navesink Formation
- Kml - Mount Laurel Formation

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Cross-Section B-B'

FIGURE 2.5.1-39 Rev 0

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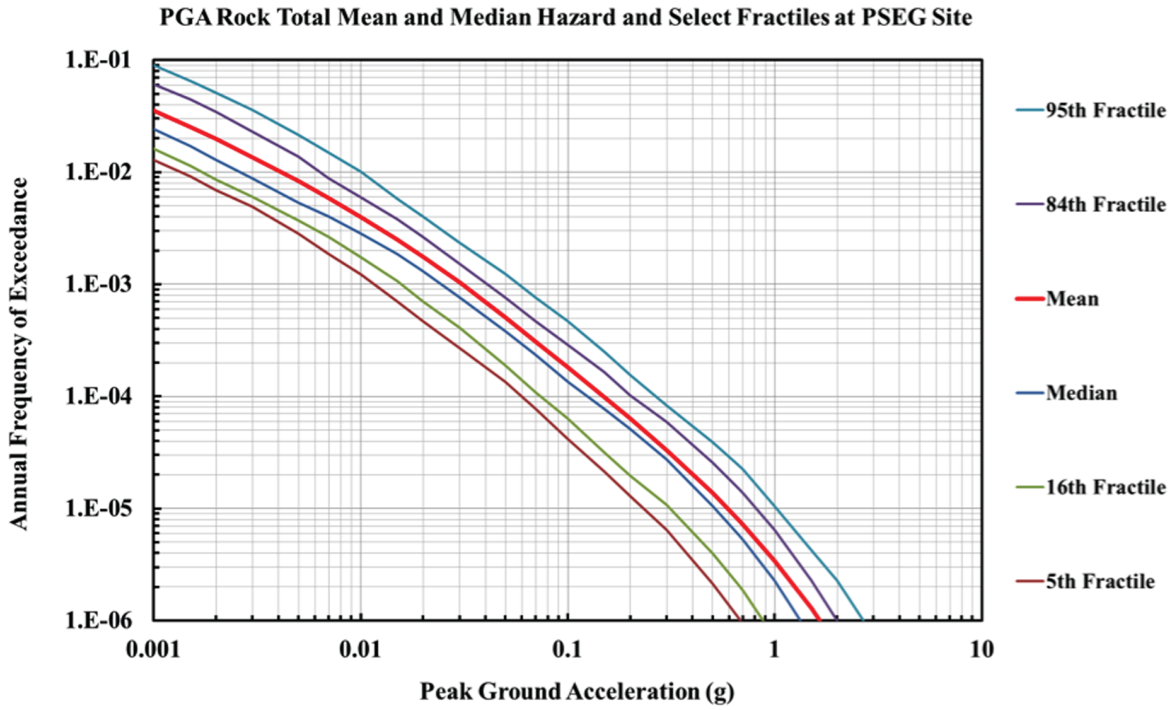
Structure Contour Map-Top of Vincentown Formation
FIGURE 2.5.1-40 Rev 1

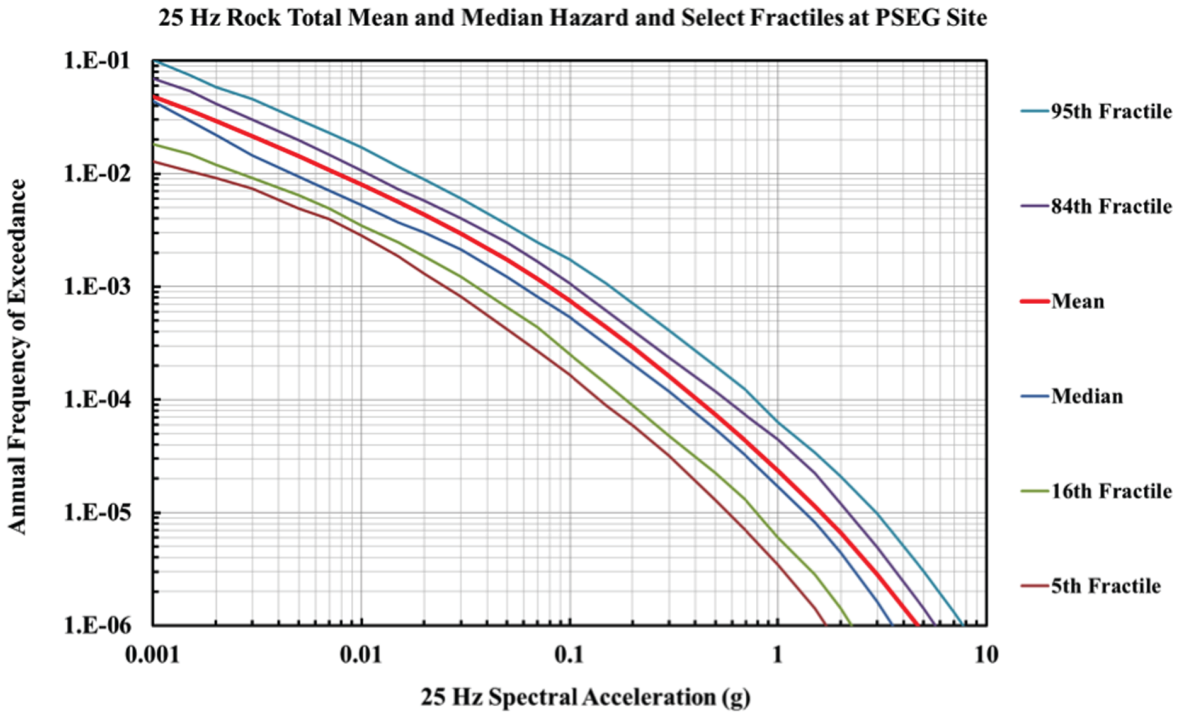


PSEG Power, LLC

PSEG Site ESPA
Part 2, Site Safety Analysis Report

Mean and Fractile
Rock Seismic Hazard Curves
for 100 Hz (PGA)
FIGURE 2.5.2-18

Rev 1

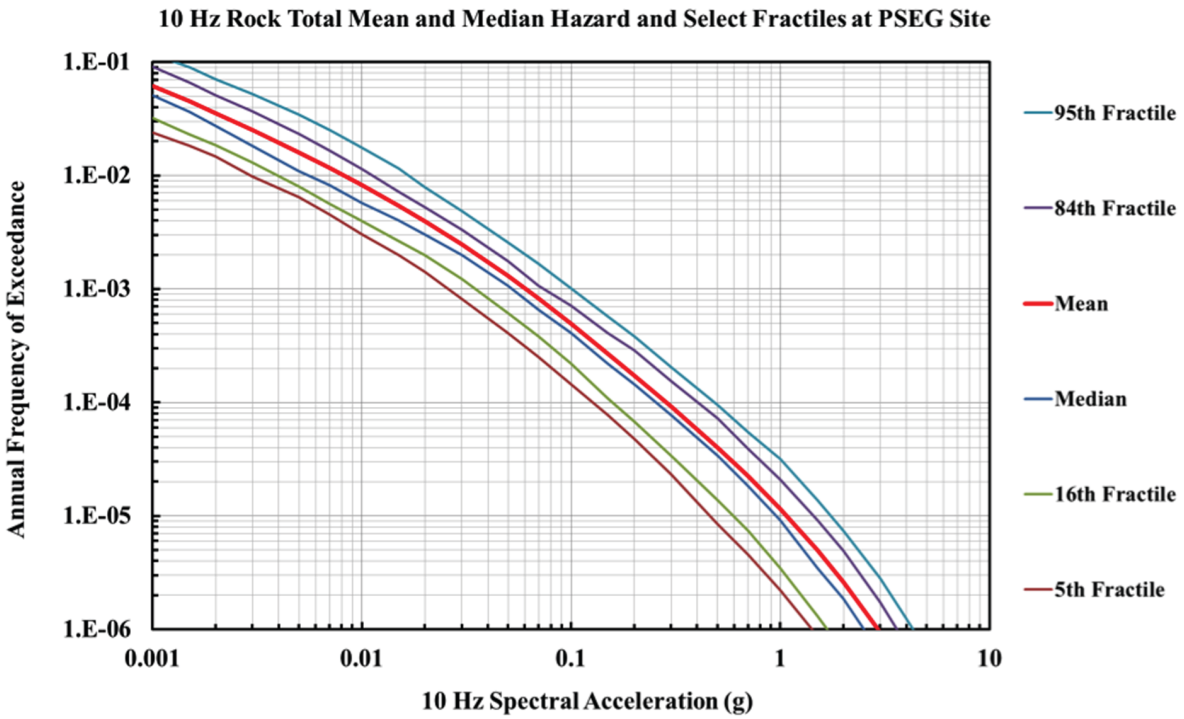


PSEG Power, LLC

PSEG Site ESPA
Part 2, Site Safety Analysis Report

Mean and Fractile
Rock Seismic Hazard Curves
for 25 Hz Spectral Acceleration
FIGURE 2.5.2-19

Rev 1



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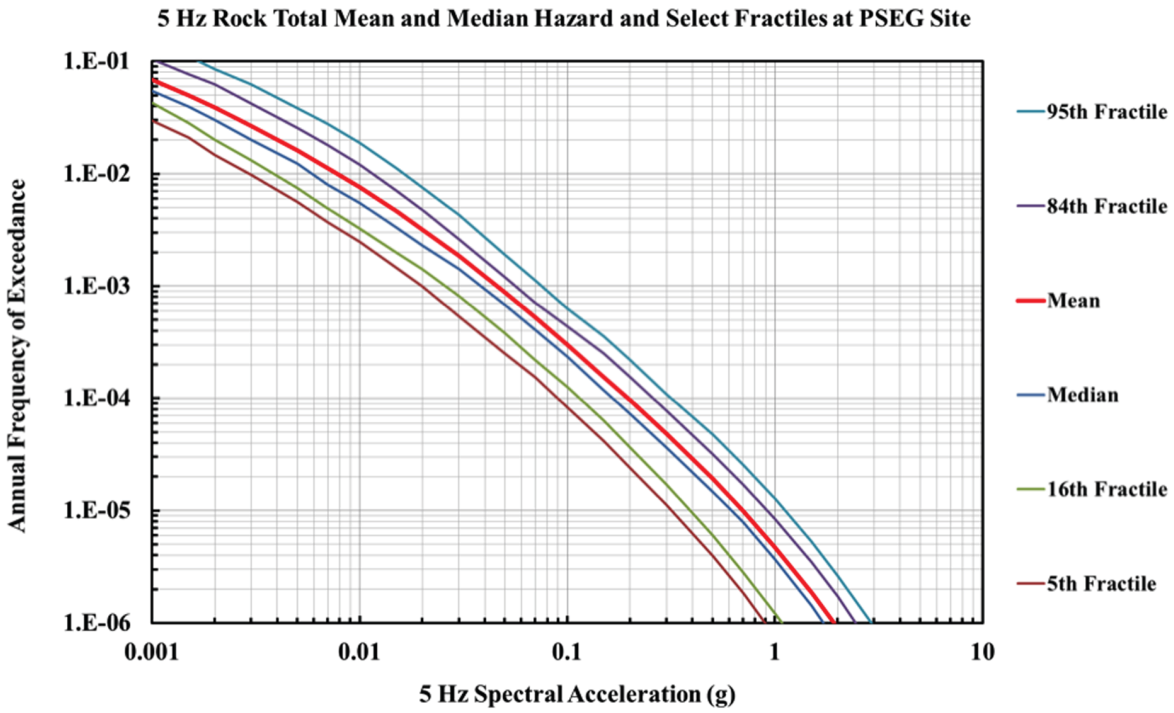
PSEG Site ESPA
Part 2, Site Safety Analysis Report

Mean and Fractile
Rock Seismic Hazard Curves
for 10 Hz Spectral Acceleration
FIGURE 2.5.2-20

Rev 1



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PSEG Site ESPA
Part 2, Site Safety Analysis Report

Mean and Fractile
Rock Seismic Hazard Curves
for 5 Hz Spectral Acceleration
FIGURE 2.5.2-21

Rev 1