U.S.NRC

United States Nuclear Regulatory Commission

Protecting People and the Environment

Presentation to the Commission

Summer Units 2 and 3 COL Application Review

Safety Evaluation Report Panel 2

October 12, 2011

FSAR Section 2.4: Major Hydrologic Surface Water Features

Monticello Reservoir PMF Pool Elevation

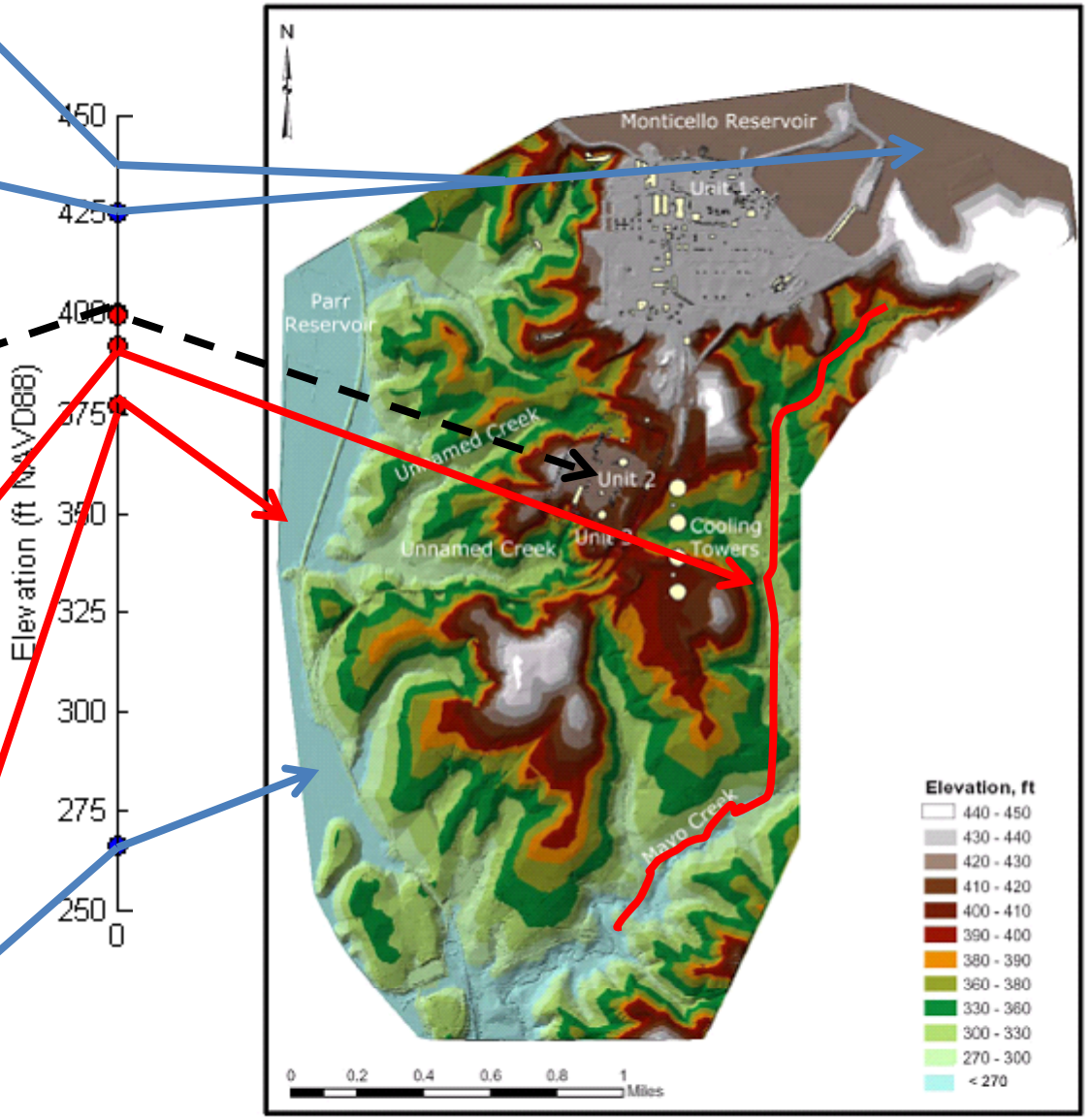
Monticello Reservoir Max Operating Pool Elevation

Site Grade (400 ft) & Local Intense Precipitation Peak Elevation (399.4 ft)

Embankment Breach Peak Flood Elevation in Mayo Creek

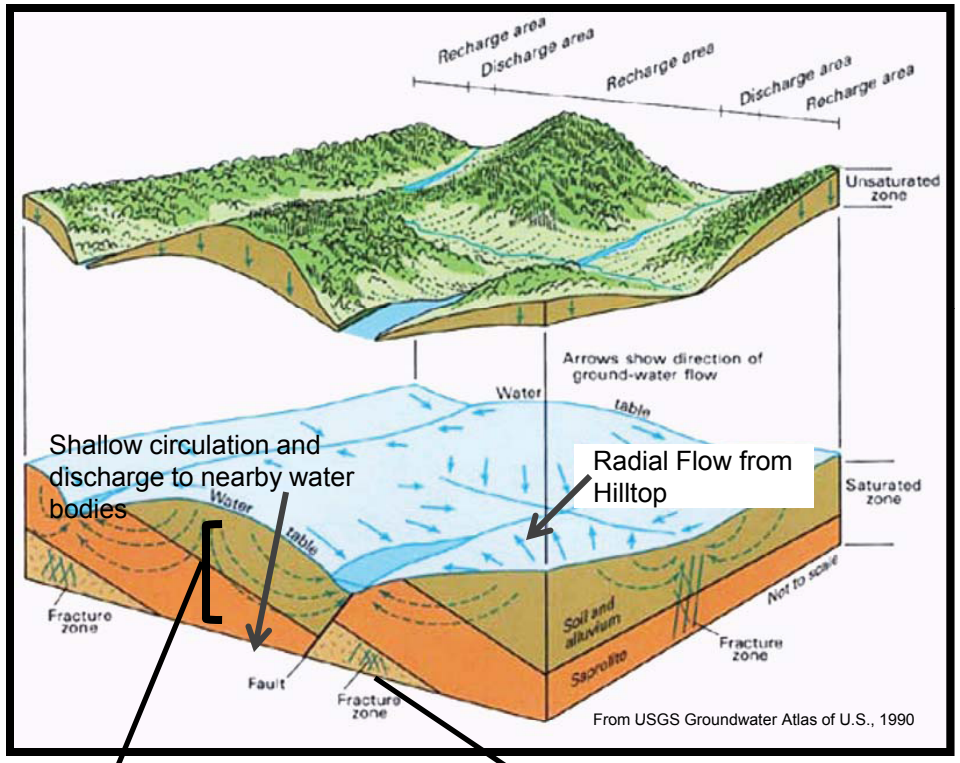
Hypothetical Upstream Dam Breach Peak Elevation at Parr Shoals Reservoir

Parr Shoals Max Operating Pool Elevation



FSAR Sections 2.4.12 and 2.4.13

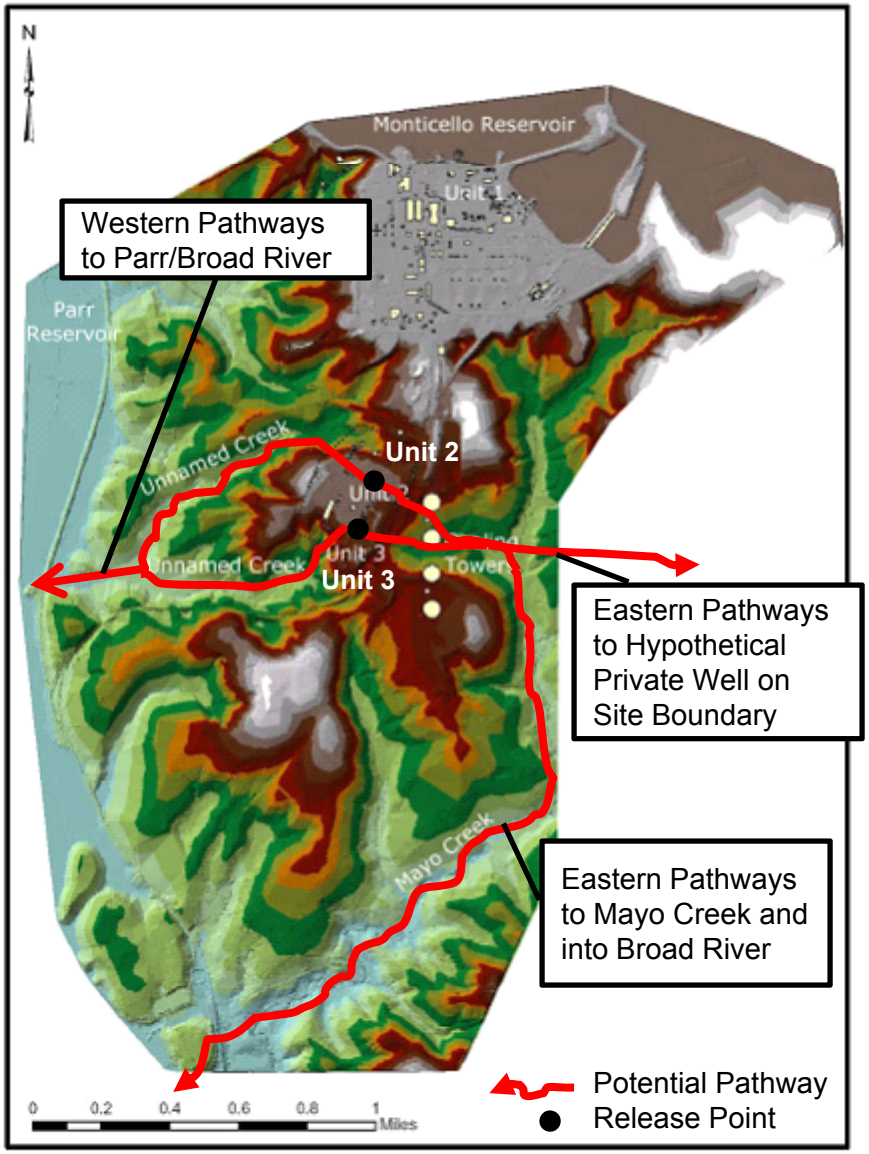
Conceptual Model for Groundwater Flow in the Piedmont Physiographic Province



Surficial Soils and Weathered Shallow Bedrock (Saprolite/Shallow Bedrock Unit)

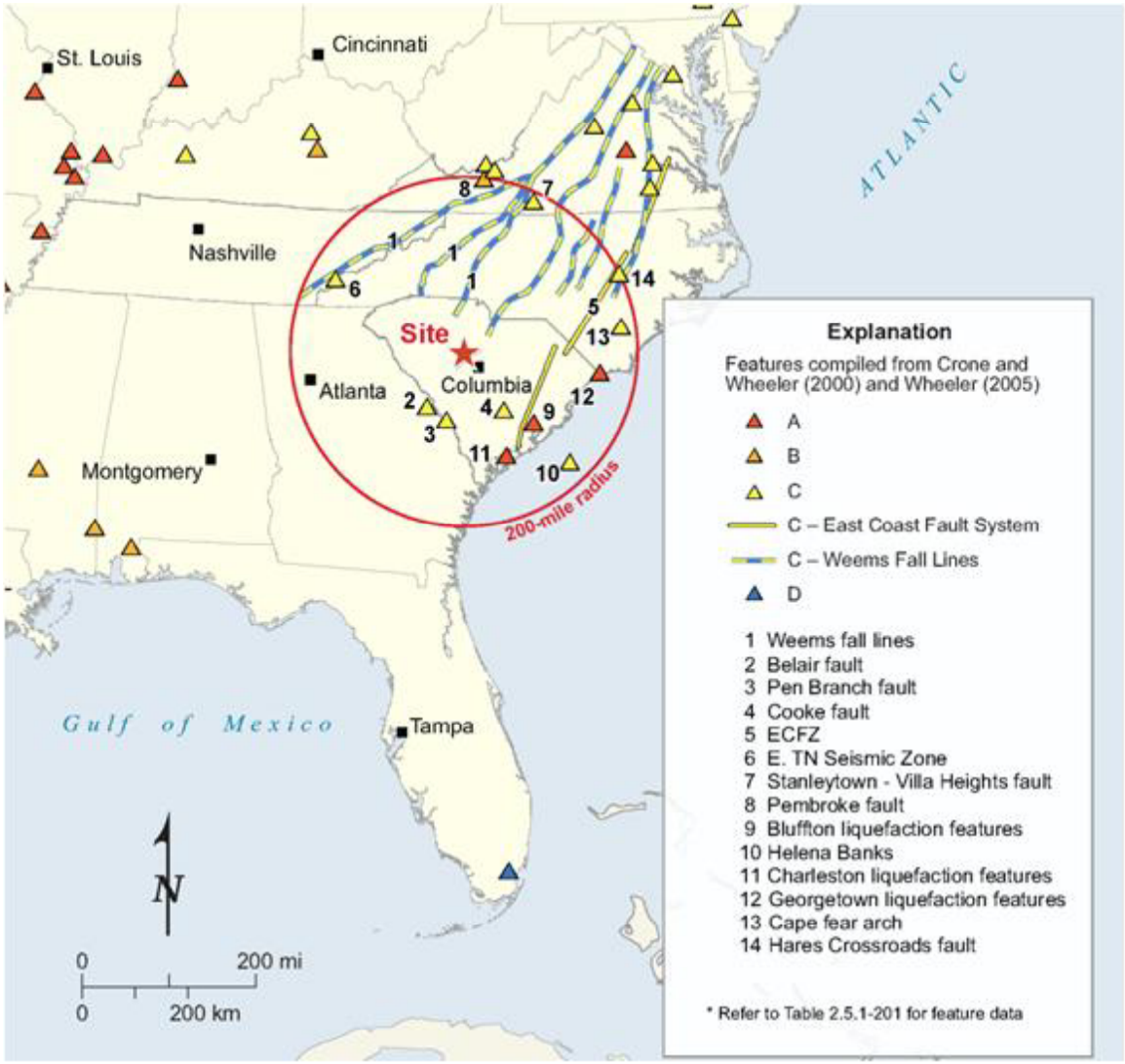
Less Permeable Deep Bedrock Unit (about 30 feet beneath final site grade)

Bounding Set of Plausible Pathways for Accidental Effluent Release Analysis



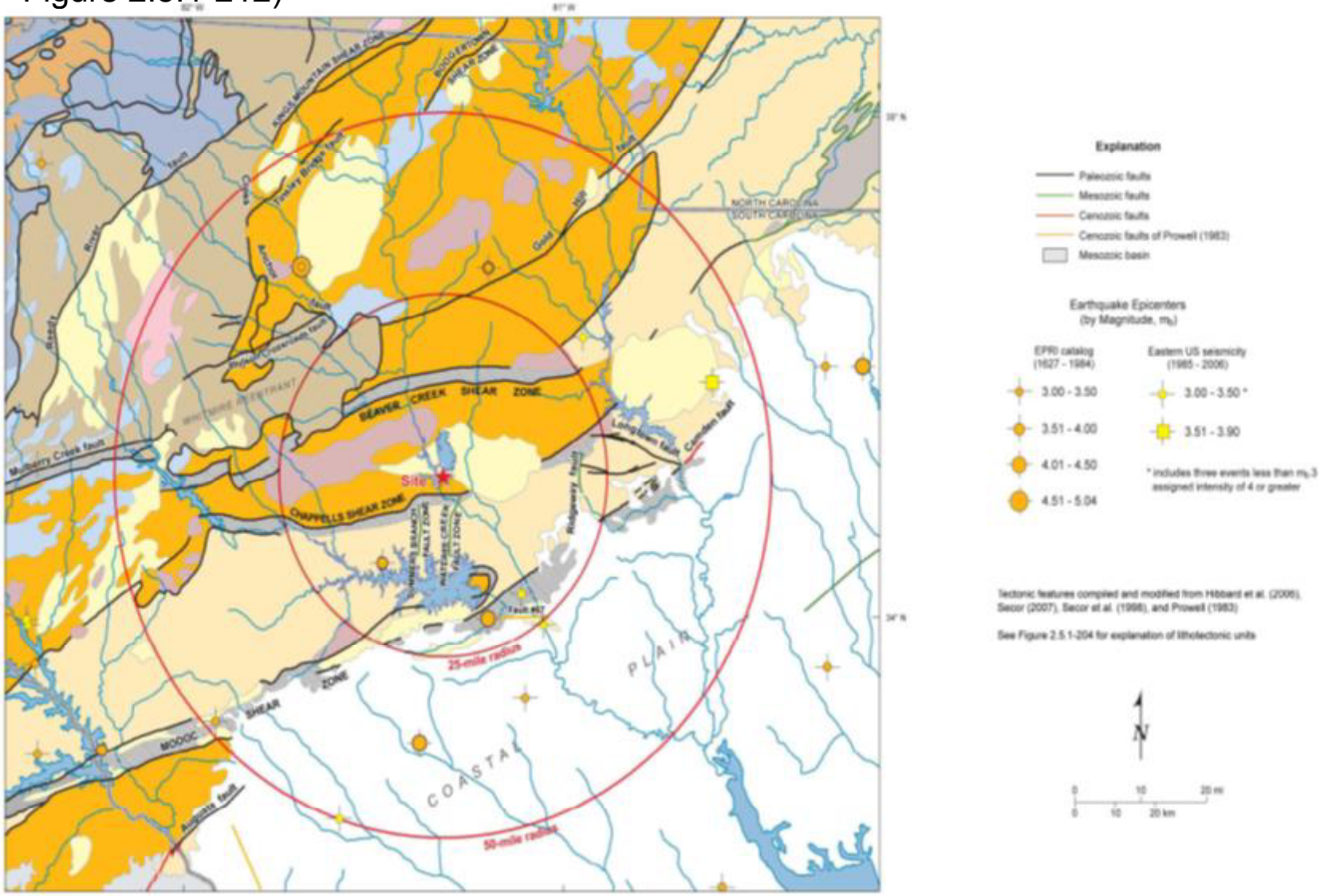
2.5.1 – Basic Geologic and Seismic Information

Potential Quaternary Features in the VCSNS Site Region (AFSER Figure 2.5.1-2 after FSAR Figure 2.5.1-215)



2.5.3 Surface Faulting

V. C. Summer Site Vicinity Tectonic Features Map (AFSER Figure 2.5.3-1 after FSAR Figure 2.5.1-212)

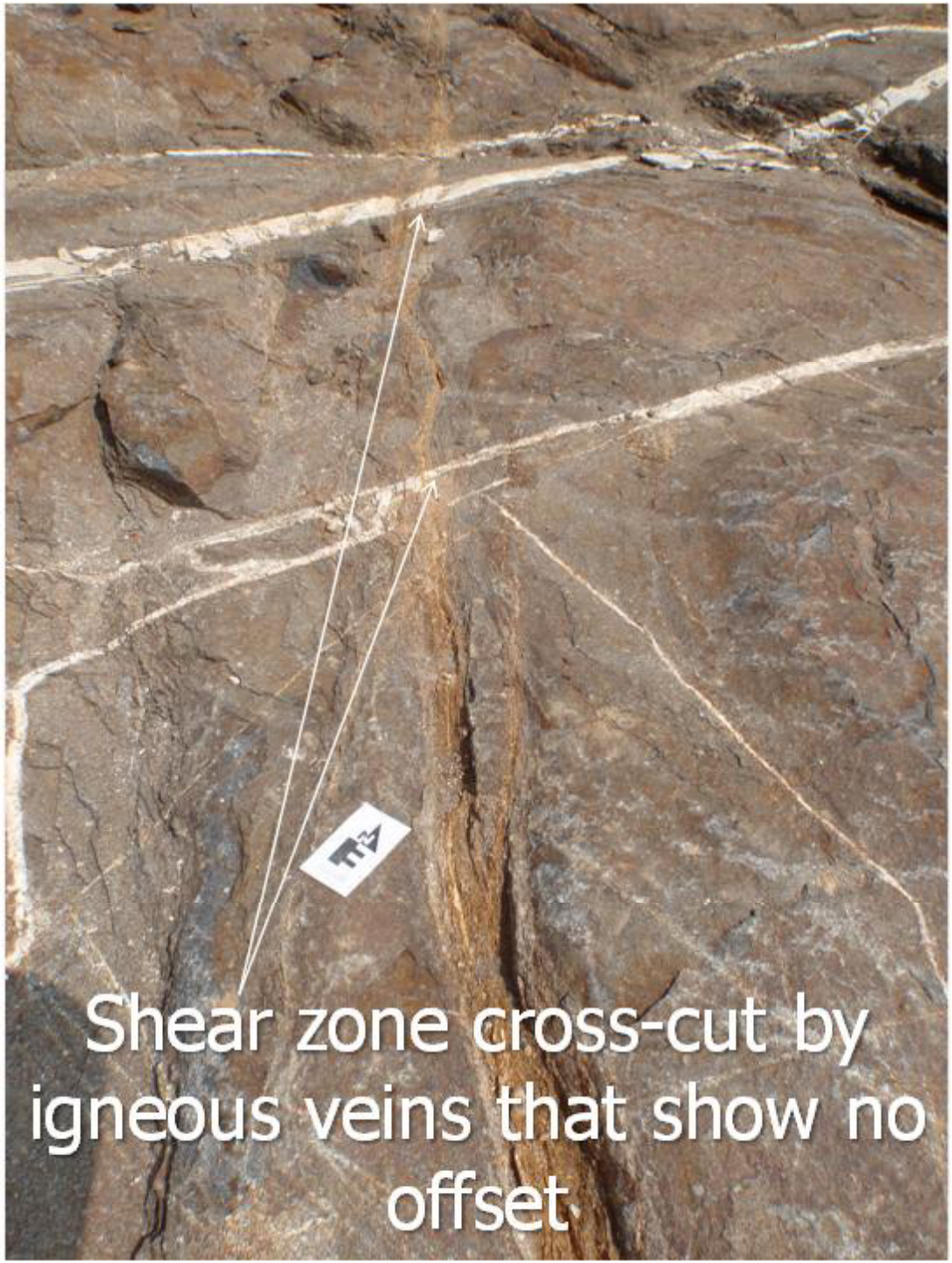


2.5.3 Surface Faulting

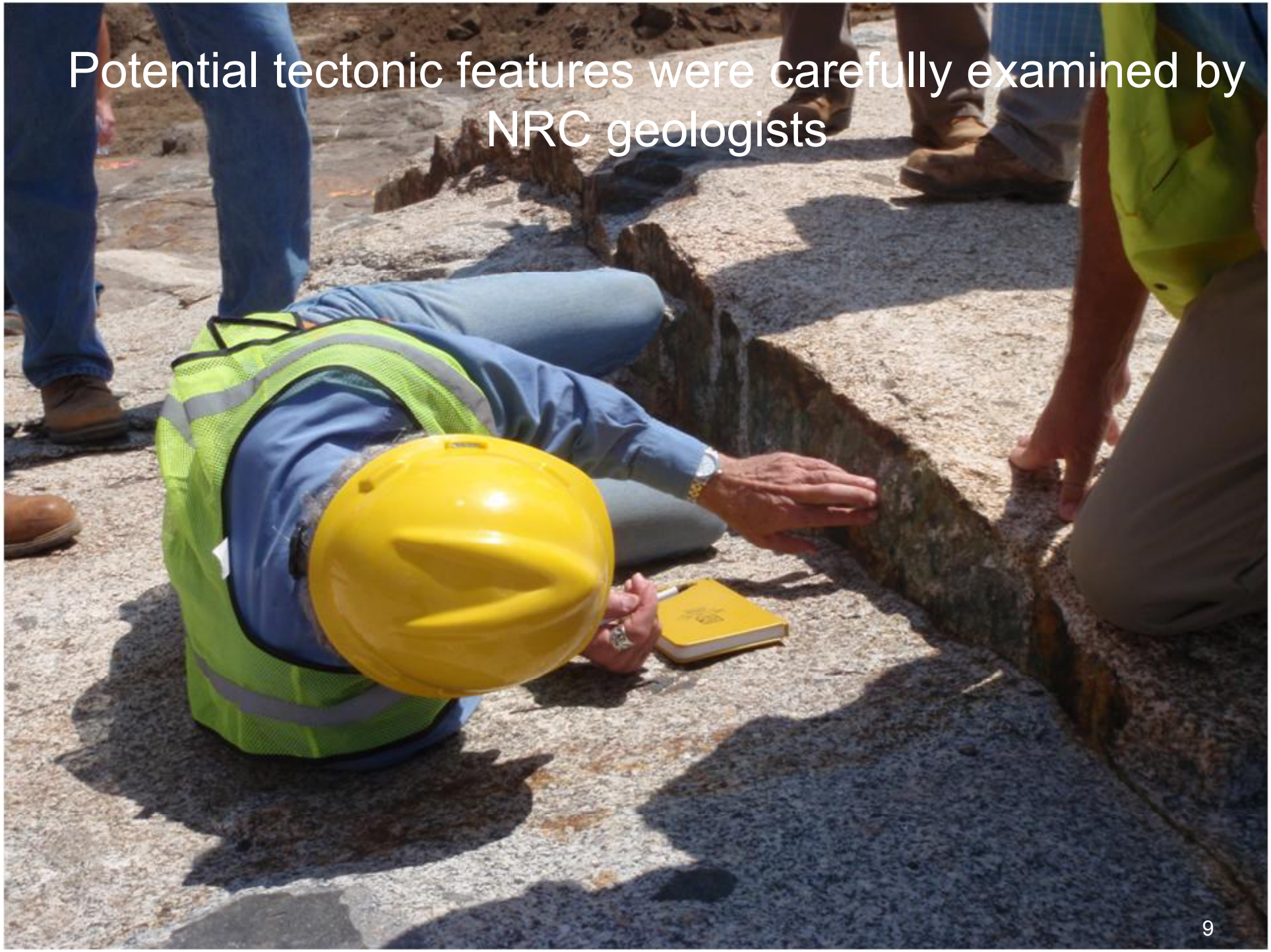
Exposure of the Wateree Creek fault (206-144 Ma in age), located 3 km (2 mi) south of the VCSNS site

2.5.1 Basic Geologic and Seismic Information

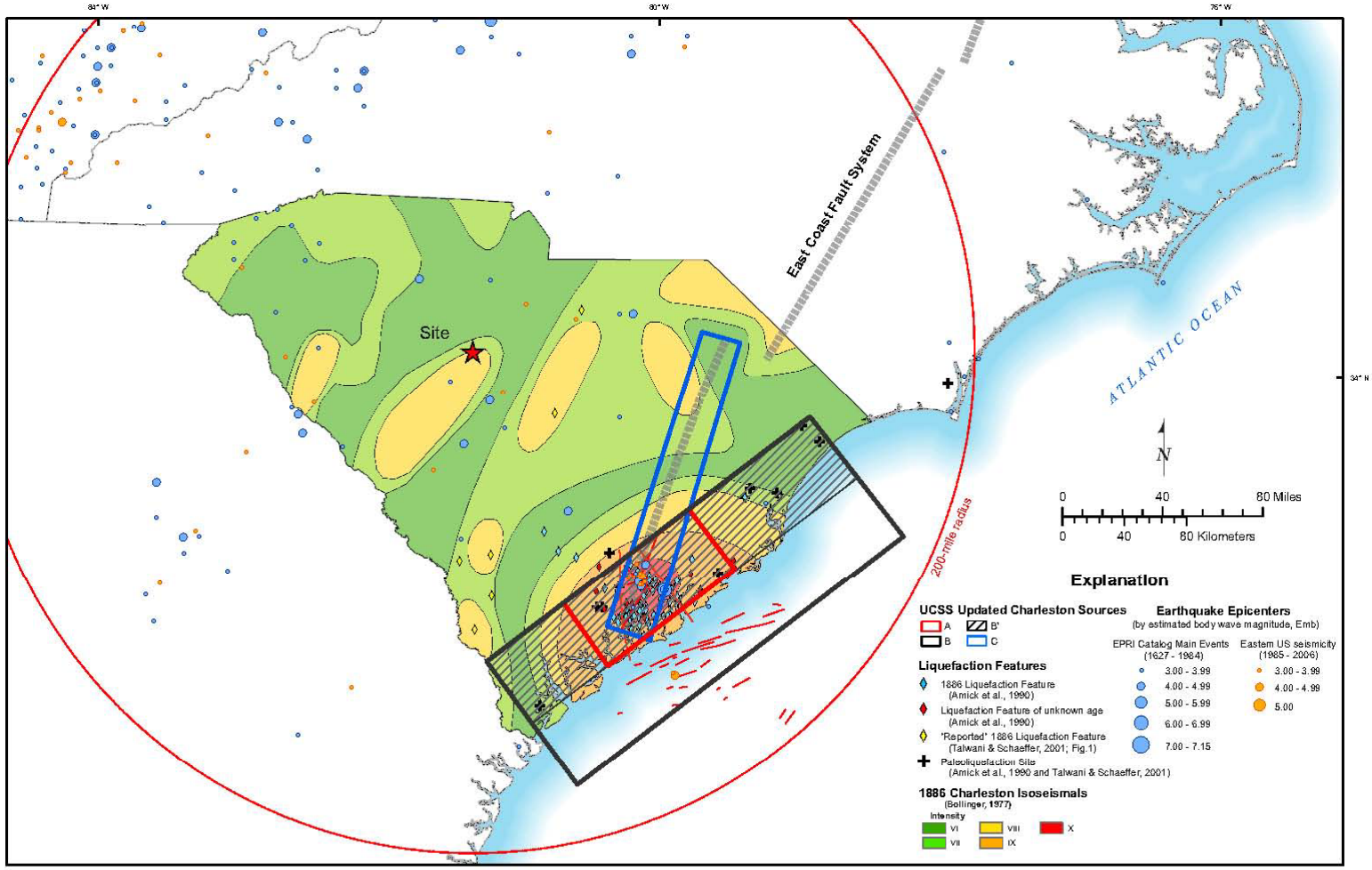
- **Geologic mapping of the Unit 2 excavation to assess the presence of tectonic features**
  - In August 2010 and April 2011, the staff directly examined geologic features being mapped by the applicant in the Unit 2 excavation to ensure that no capable tectonic structures existed therein.
  - Based on direct examination the staff found the FSAR descriptions of the geology to be consistent with field observations and that no capable tectonic structures, or other potentially detrimental geologic features, occur in the Unit 2 excavation
  - On the basis of these trips, a geologic mapping license condition is unnecessary for Summer Unit 2
  - The staff proposes including the geologic mapping license condition for Summer Unit 3 pending the staff's observations of the Unit 3 excavation


Shear zone cross-cut by igneous veins that show no offset.

Potential tectonic features were carefully examined by NRC geologists



Section 2.5.2–Vibratory Ground Motion



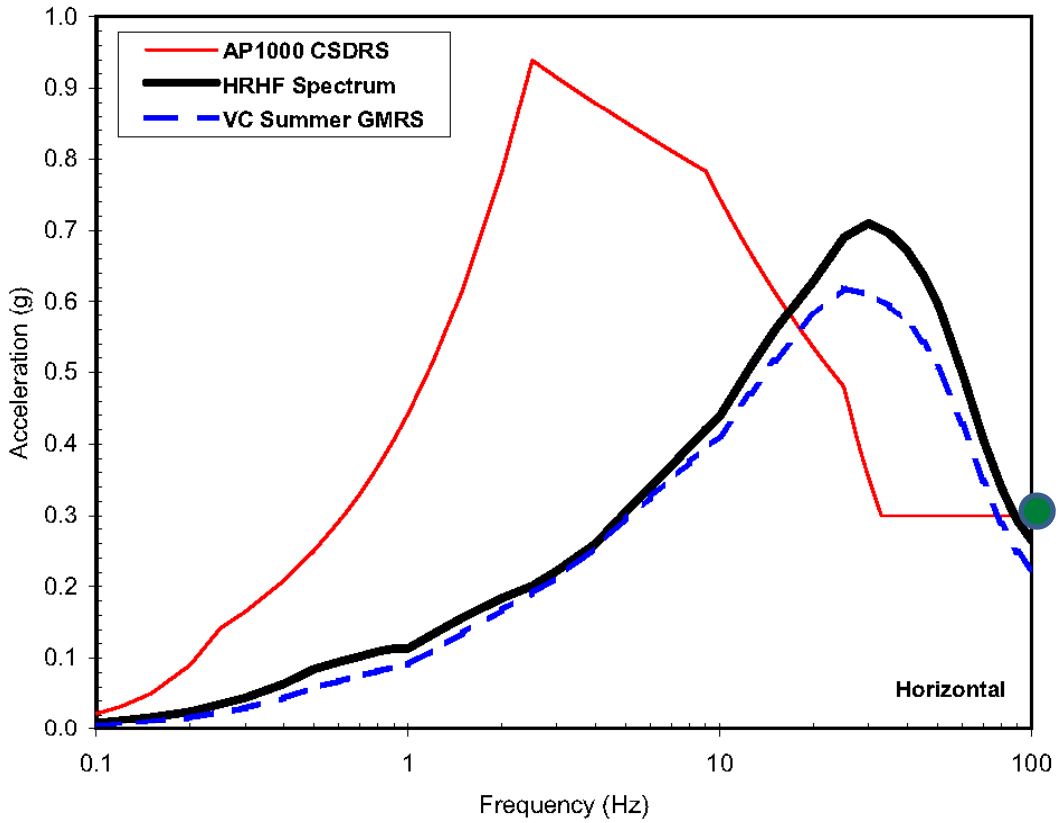
Updated Charleston Seismic Source (UCSS) Model
(FSAR Figure 2.5.2-213)

Section 2.5.2–Vibratory Ground Motion

- **Eastern Tennessee Seismic Zone (ETSZ)**
  - The Staff requested that the applicant address new seismic source information for the ETSZ in its probabilistic seismic hazard analysis (PSHA).
  - SCE&G referenced a generic sensitivity study conducted in 2008 by the Nuclear Energy Institute (NEI), which showed that potential changes to the seismic hazard resulting from updating the ETSZ are not significant and thus performing updates to this source zone was unnecessary.
  - Staff also performed its own sensitivity calculation to determine whether the updated maximum magnitude distribution used in the NEI sensitivity study would significantly change the VC Summer ground motion response spectra (GMRS).
  - Staff's sensitivity calculation showed no significant impact to the seismic hazard for the VC Summer site.

Comparison of Ground Motion Response Spectra with Certified Design Response Spectra

- The VC Summer ground motion response spectra (GMRS) was compared to the certified seismic design response spectra (CSDRS) and the hard rock high-frequency (HRHF) spectra
- The staff concludes that the high frequency seismic input was evaluated in the AP1000 DCD and considered to be non-damaging



Comparison of the VC Summer GMRS with the AP1000 CSDRS and HRHF spectrum (FSAR Figure 2.0-201)

Seismic Margins Analysis

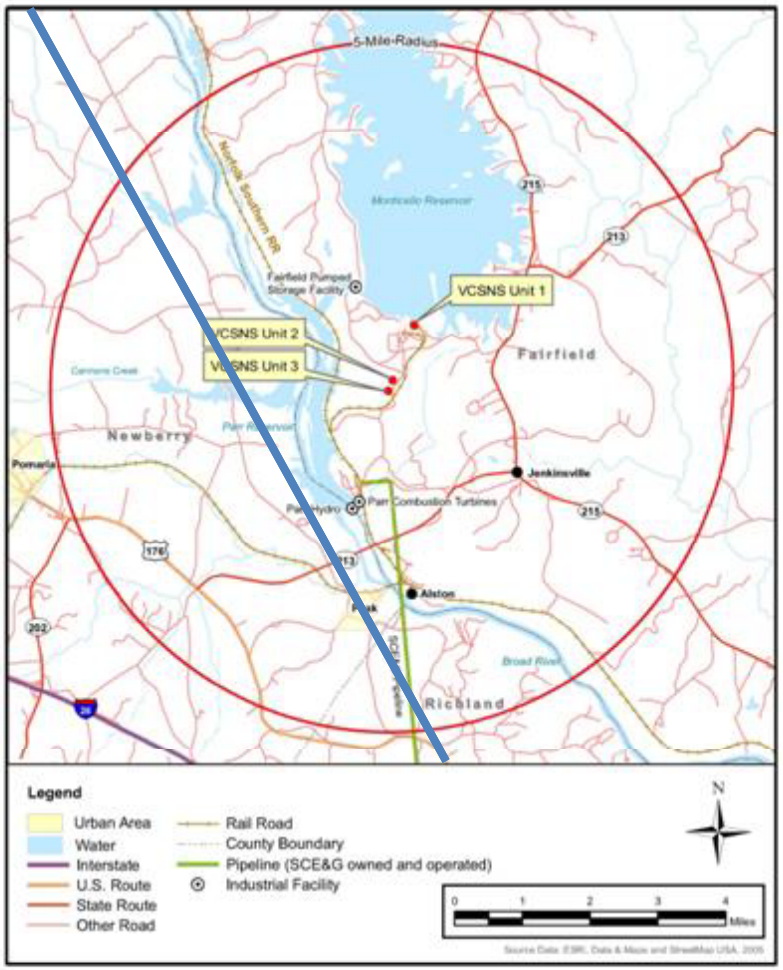
- A review-level earthquake with a peak ground acceleration of 0.5g was established in the AP1000 DCD and used to demonstrate a margin over the safe-shutdown earthquake (PGA=0.3g).
- Because the ground motion response spectra for the V.C. Summer site is bounded by the hard-rock, high-frequency spectra also analyzed in the AP1000 DCD, the staff finds that the SMA provided in the DCD bounds and demonstrates an acceptable seismic margin for V.C. Summer Units 2 and 3.

V.C. Summer Nearby Facilities

From VCSNS FSAR
Figures 2.2-201 & -202

Site Vicinity Map of Industrial Facilities inside a 5-Mile Radius of Units 2 and 3

Airway V53



V.C. Summer External Events

External Event	Screening Criteria Applied			
	Bounded	Negligible Frequency	Negligible Consequence	Not Applicable
Tornado	•			
Hurricane	•		•[1]	
External flood				PMP flood < 400’ (grade)
Aviation		•		
Marine				No barge traffic
Pipeline	•			Nearest pipeline >1 mi.
Railroad			•	$D_{closest\ track} > D_{standoff}$
Truck	•			
Nearby facilities			•	
External fires			•	

[1] Extratropical cyclones