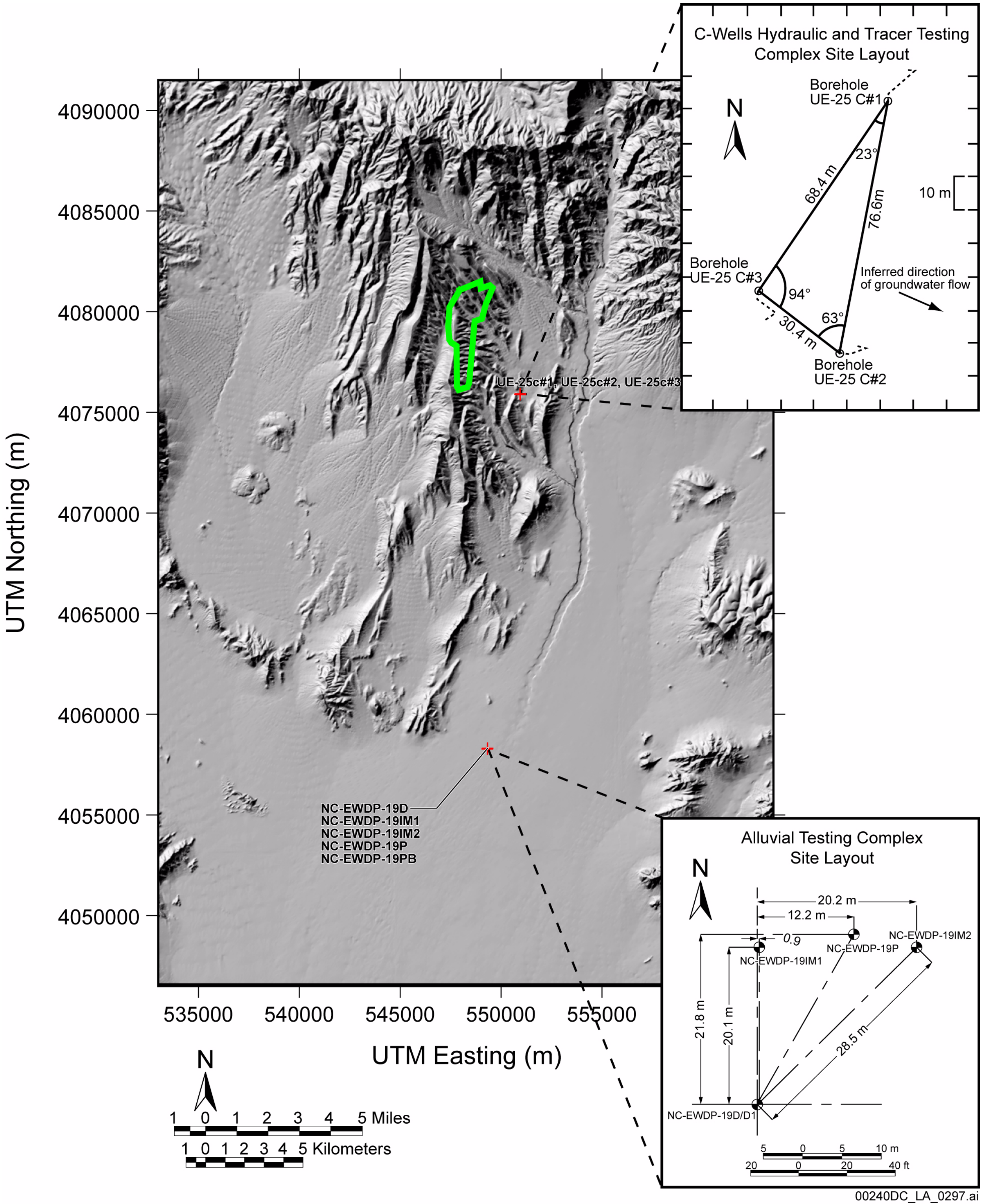

Figure 5-11. Location of the C-Wells and the Alluvial Testing Complex

Source: SNL 2007a, Figures 6.1-1, 6.1-6, 6.1-7, and 6.1-8.

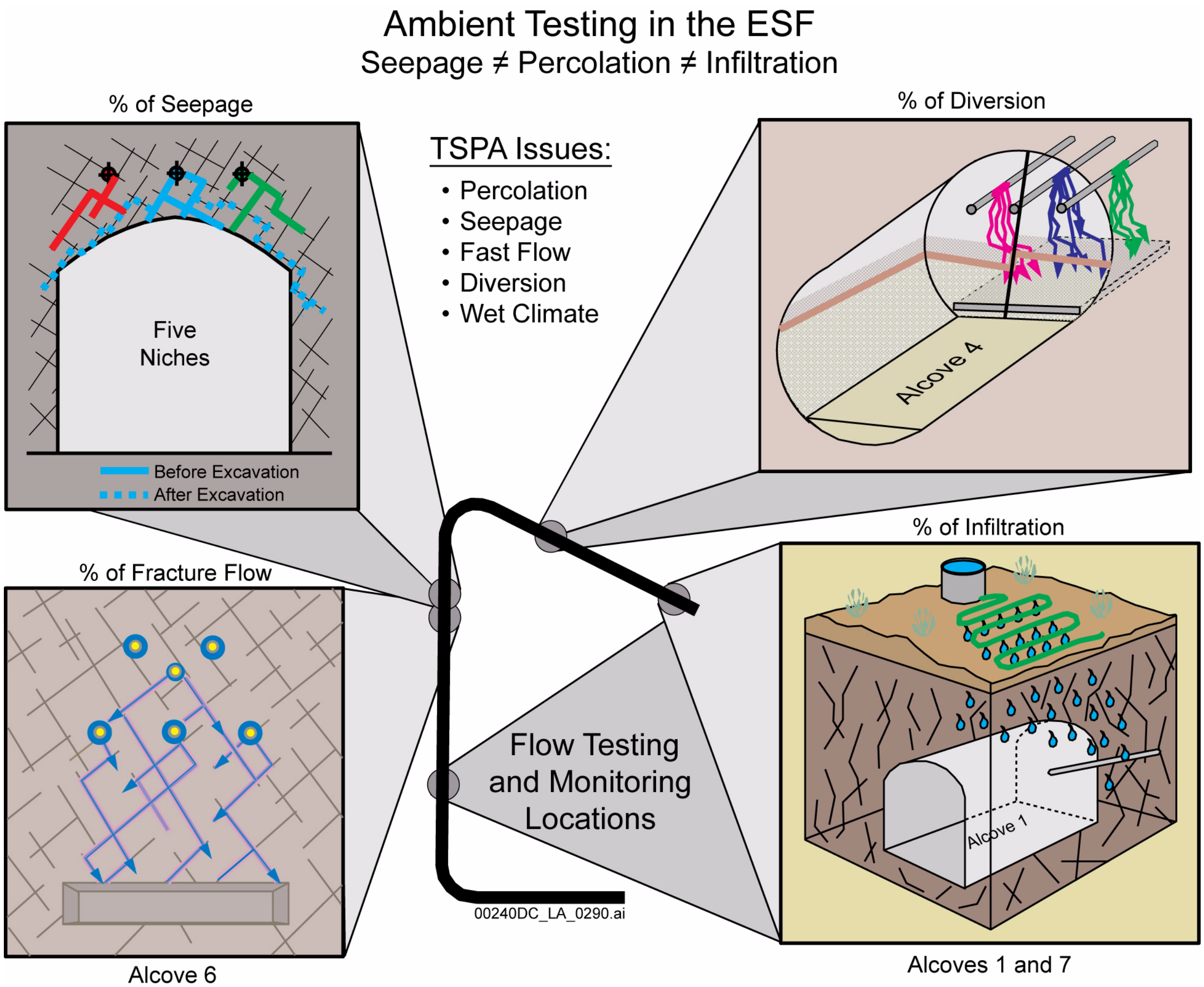

Figure 5-12. Schematic Illustration of Flow Tests in the Exploratory Studies Facility at Yucca Mountain

NOTE: The tests evaluate functional relationships between unsaturated zone processes to resolve TSPA issues. Different colors are used to schematically track the source of the water to its respective release point.

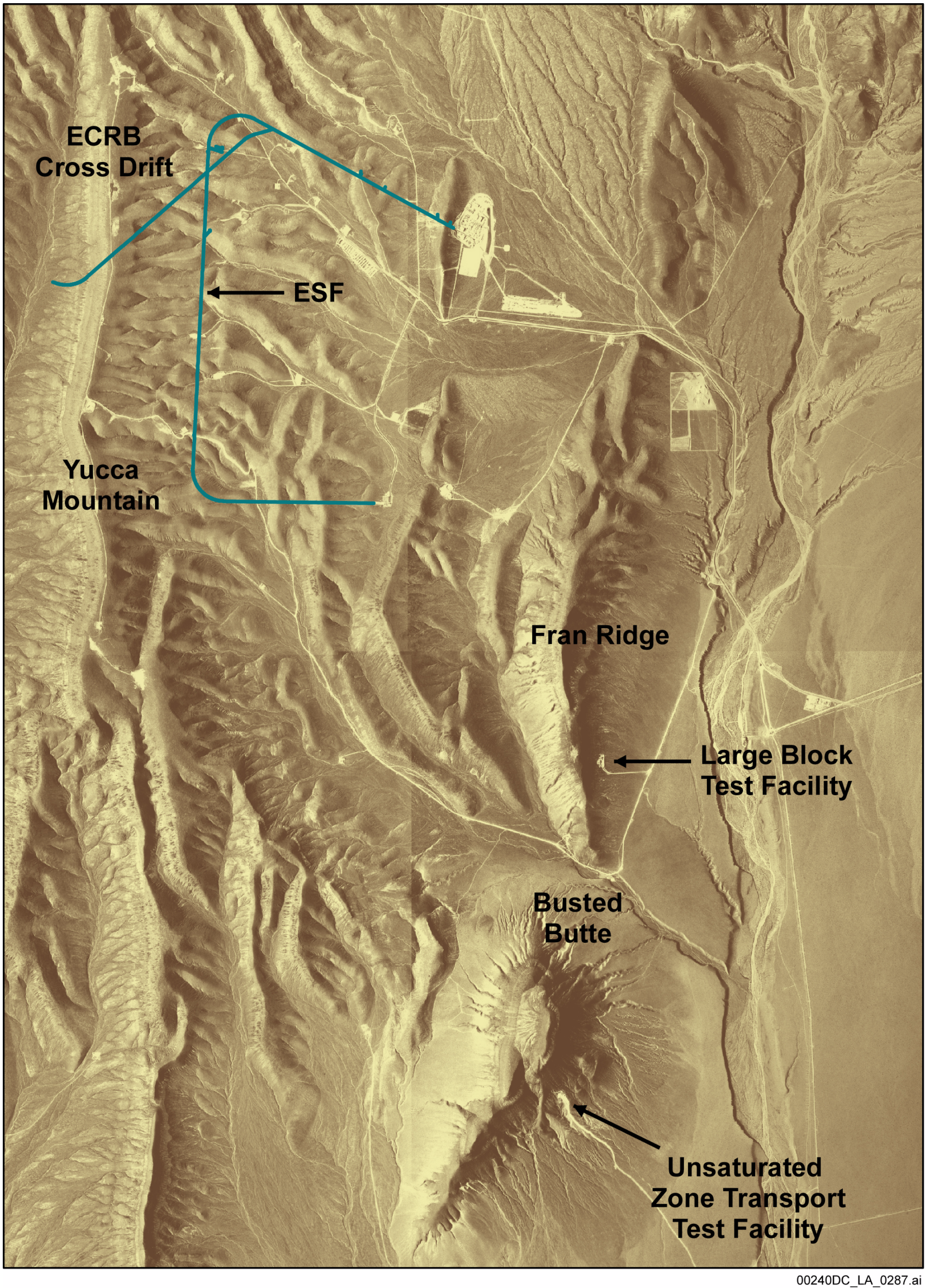

Figure 5-13. Location of the Unsaturated Zone Transport Test at Busted Butte and the Large Block Test on Fran Ridge

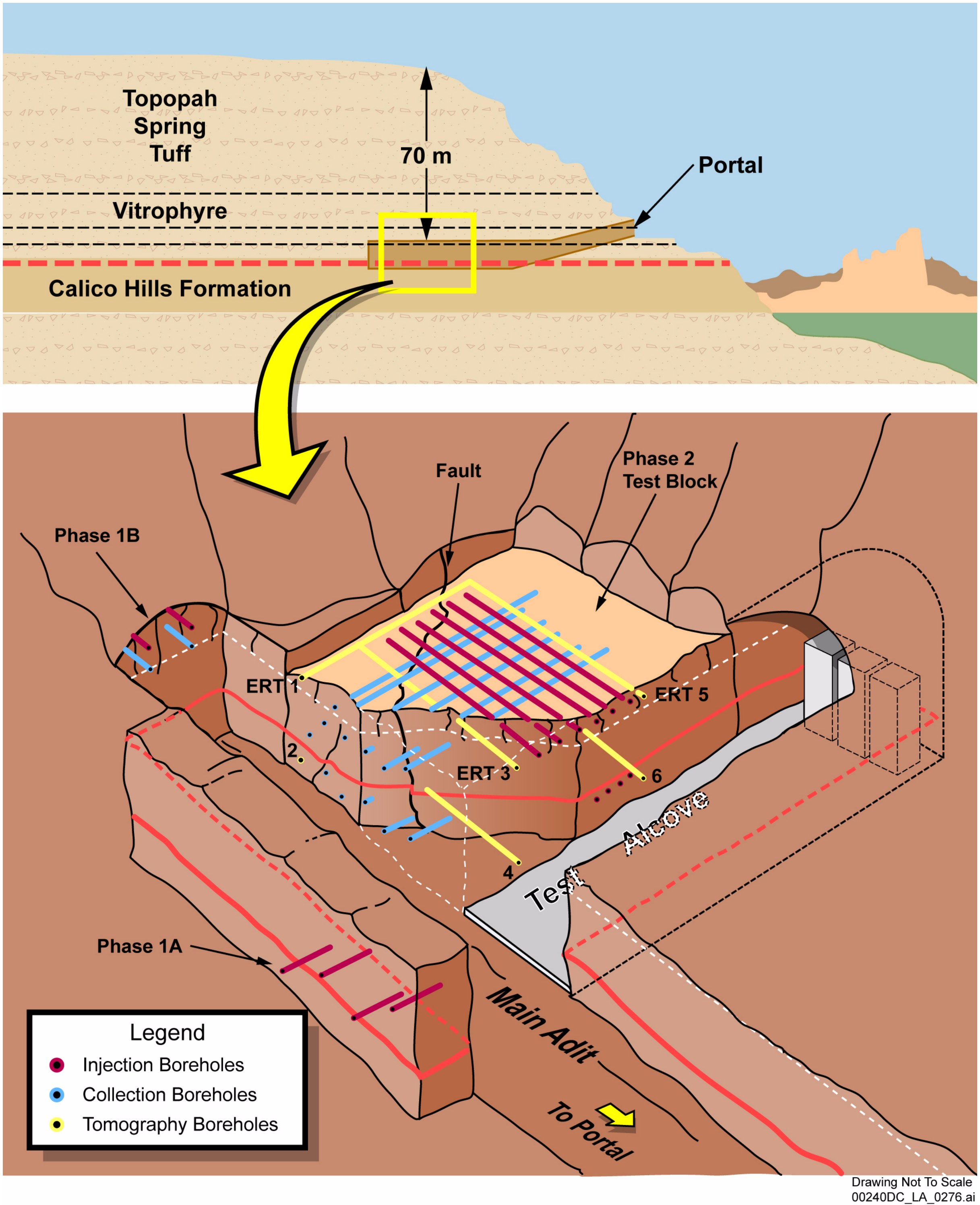

Figure 5-14. Schematic Layout of Busted Butte Unsaturated Zone Transport Test

NOTE: The shows the relative locations of the test's phases and borehole locations. Orange solid and dotted line indicates contact between Tptpv1 and Tac units.
ERT = electrical resistivity tomography.

Source: BSC 2004e, Figure 6-168.

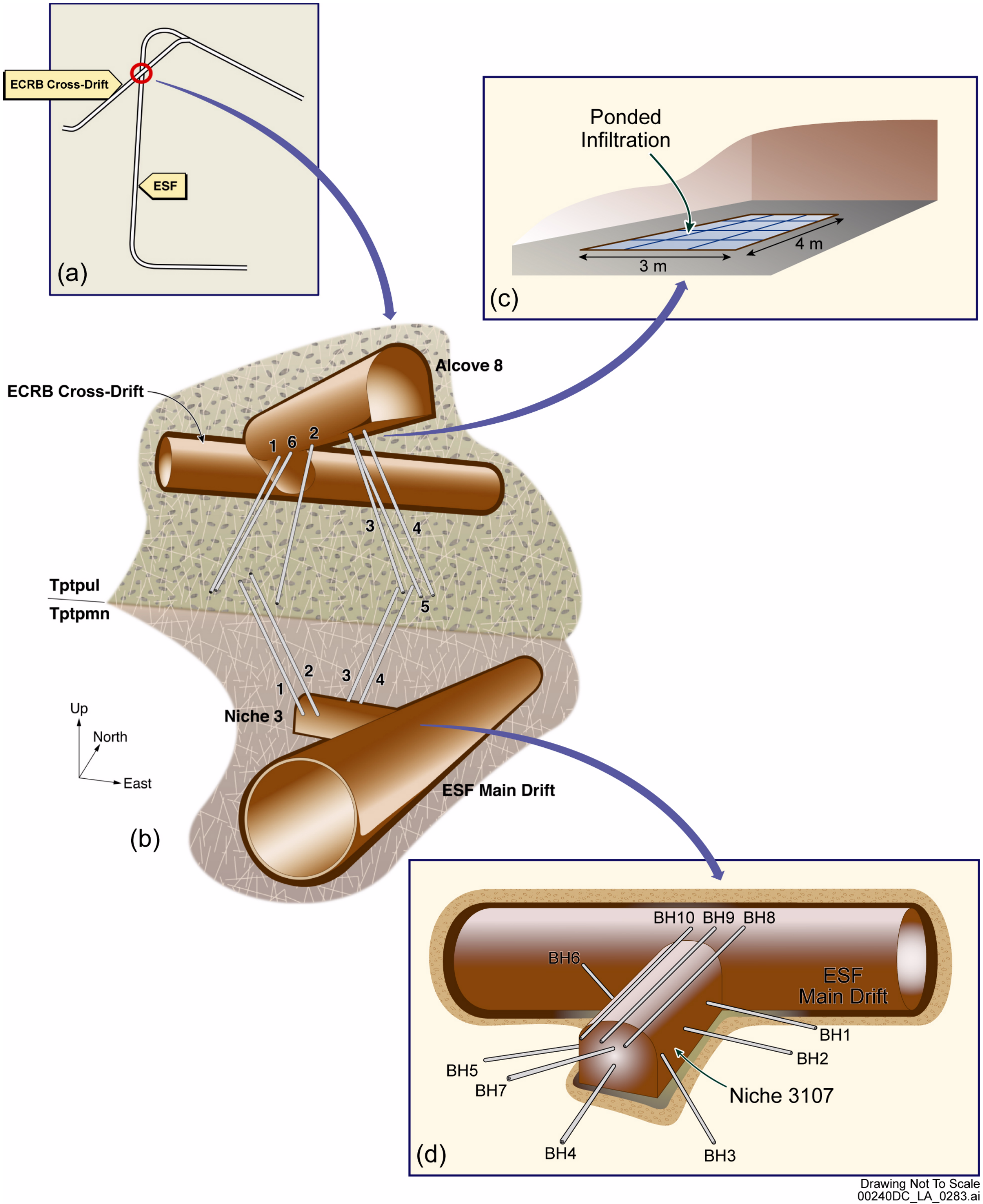

Figure 5-15. Test Bed for the Alcove 8–Niche 3 Tests

NOTE: The ECRB Cross-Drift crosses the ESF at a distance of about 20 m above the ESF (Insert (b)).

Source: BSC 2006a, Figure 6.1-1; BSC 2004e, Figure 6-149.

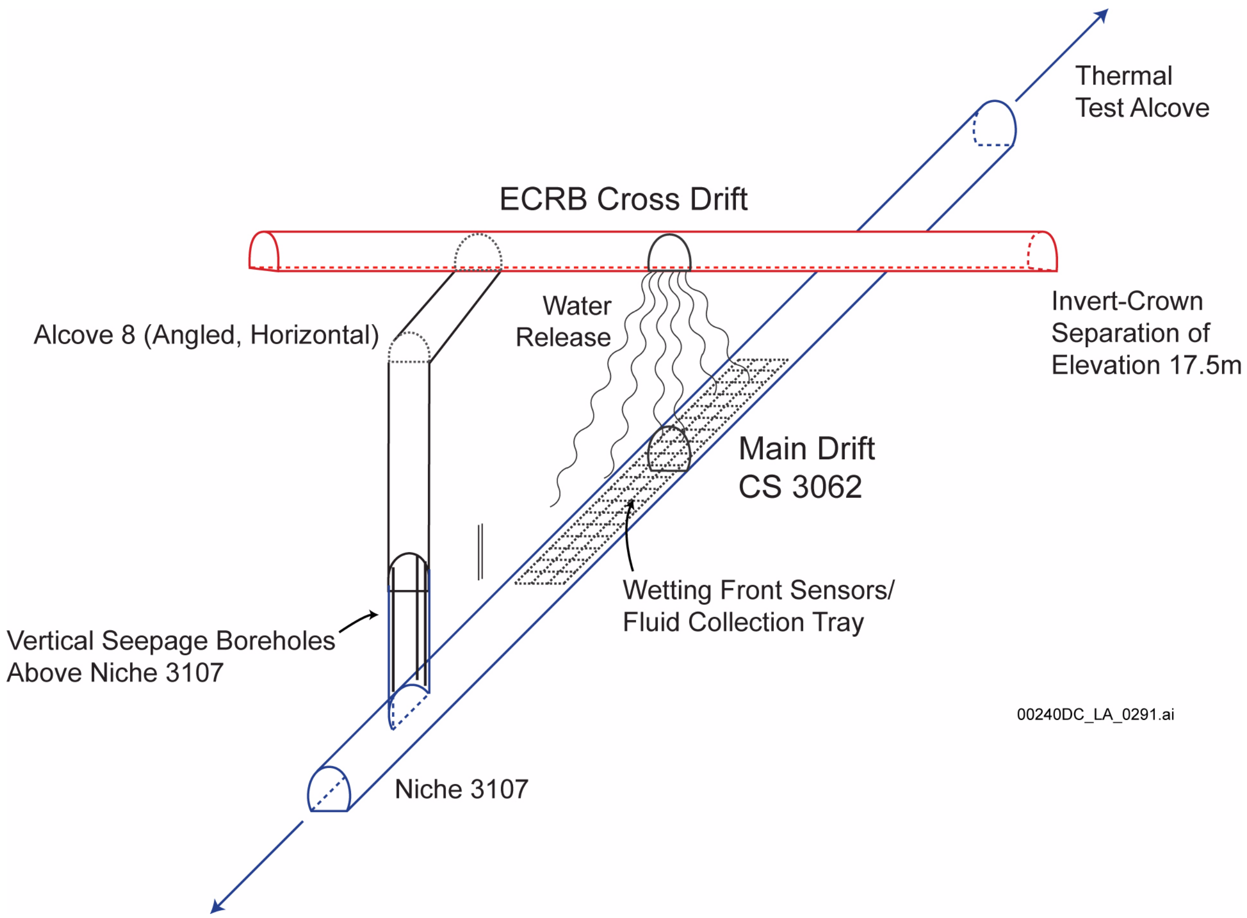

Figure 5-16. Schematic Illustration of the Crossover Point of ECRB Cross-Drift with the Main Drift

NOTE: Wetting-front sensors and fluid collection trays monitored the construction-water migration. Both the ECRB Cross-Drift and the main drift, together with Alcove 8 and Niche 3 (Niche 3107) and its boreholes, are horizontal in this illustration. Alcove 8 is directly above Niche 3 (Niche 3107).

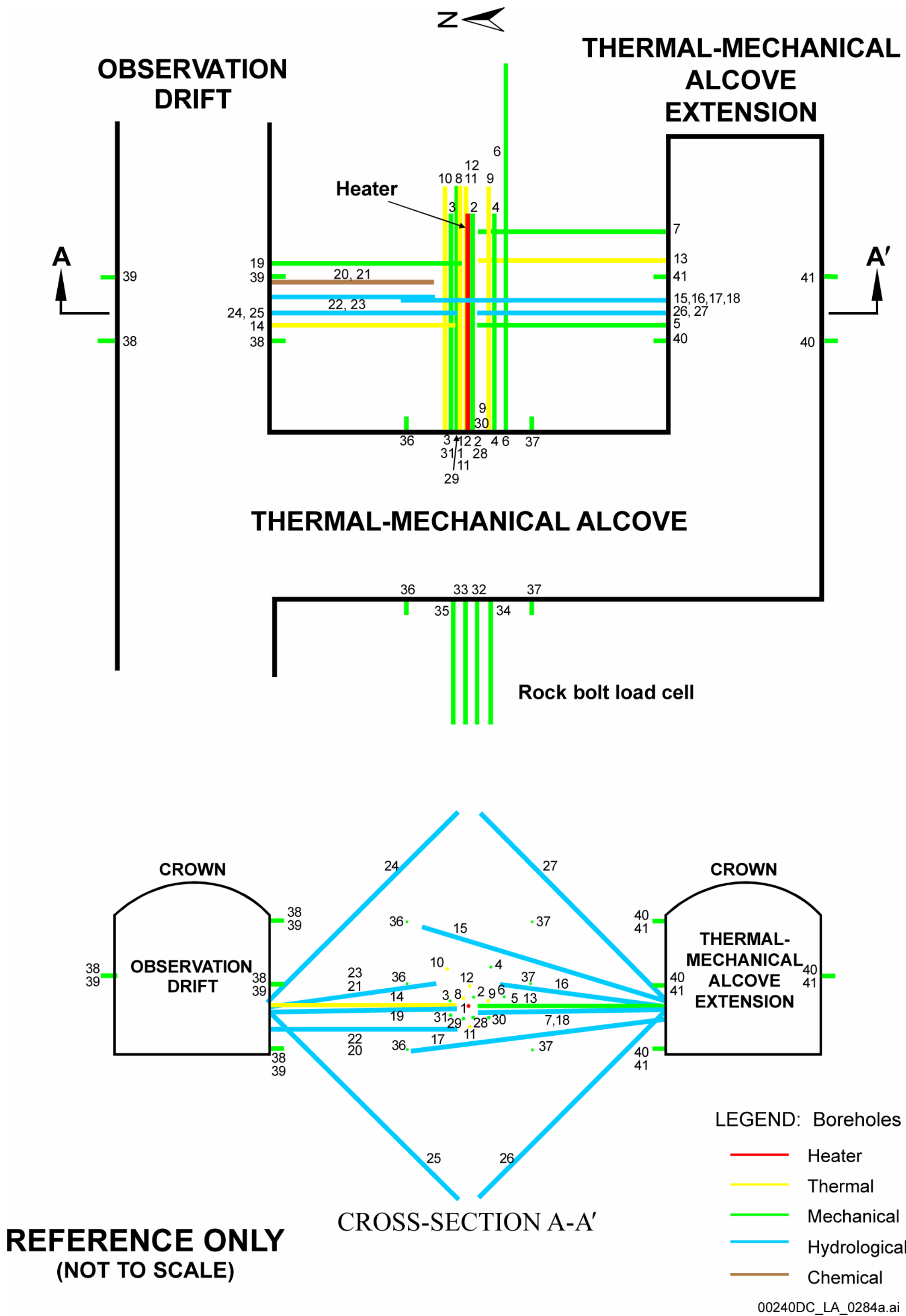

Figure 5-17. Schematic of the Single Heater Test Layout of the Instrumentation Boreholes

Source: SNL 2007d, Figure 6.2-2.

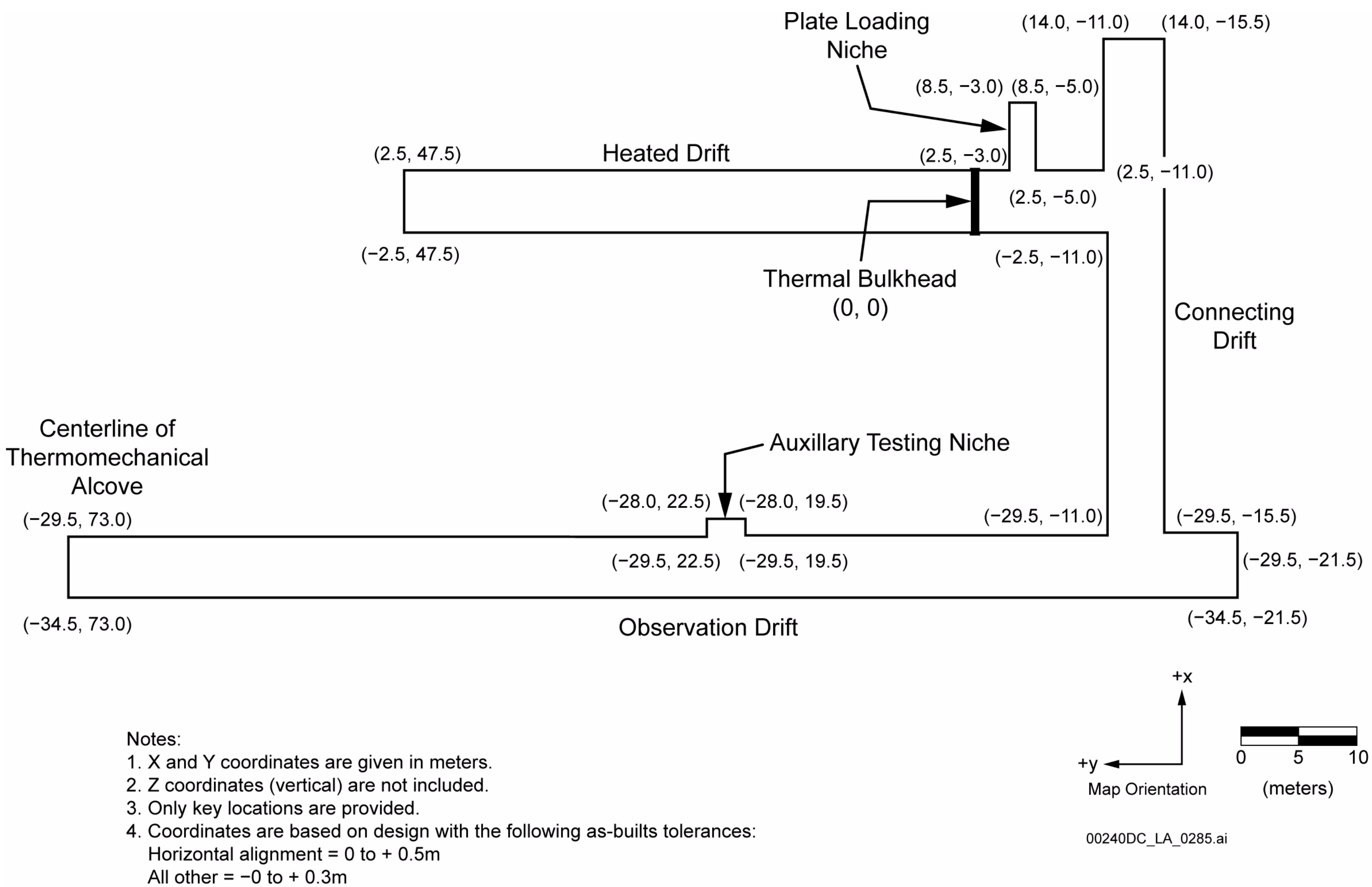

Figure 5-18. Drift Scale Test As-Built Plan View with Two-Dimensional Coordinates of Key Locations

Source: CRWMS M&O 1998d, Section 3.1.

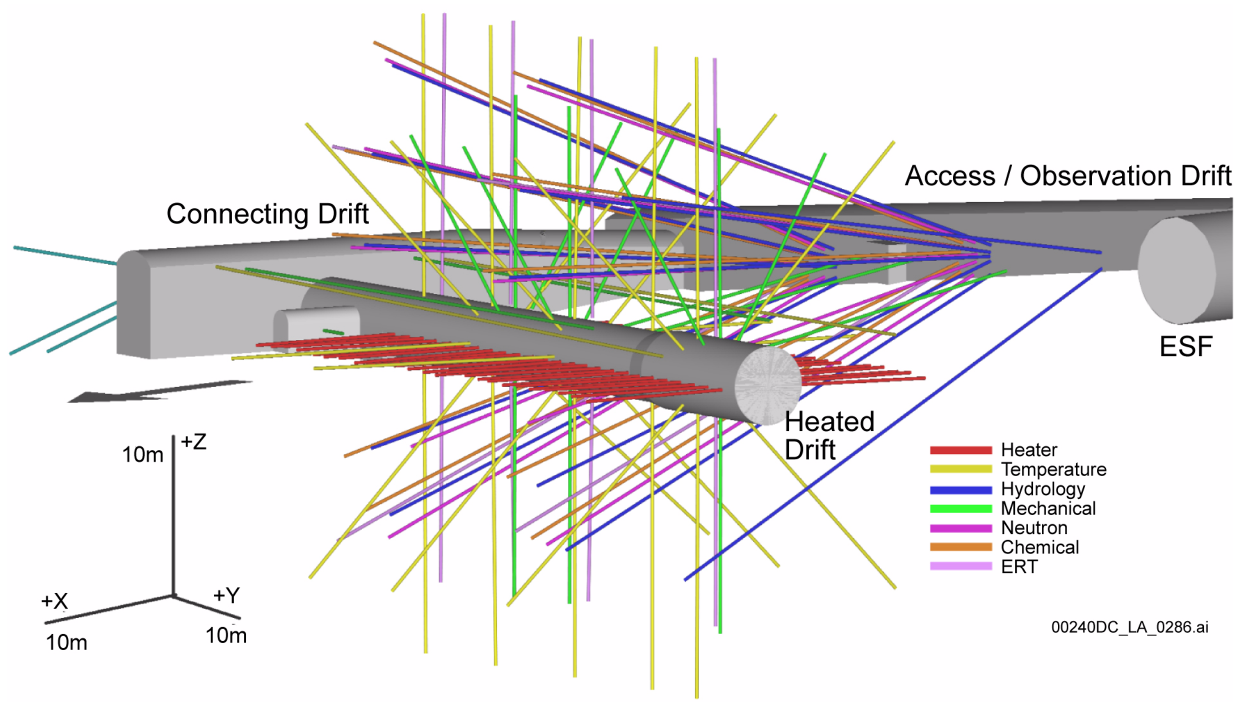

Figure 5-19. Temperature (Resistance Temperature Detector) Boreholes of the Drift Scale Test

NOTE: Schematic is prepared from coordinates based on an origin located at the center of the heated drift bulkhead.

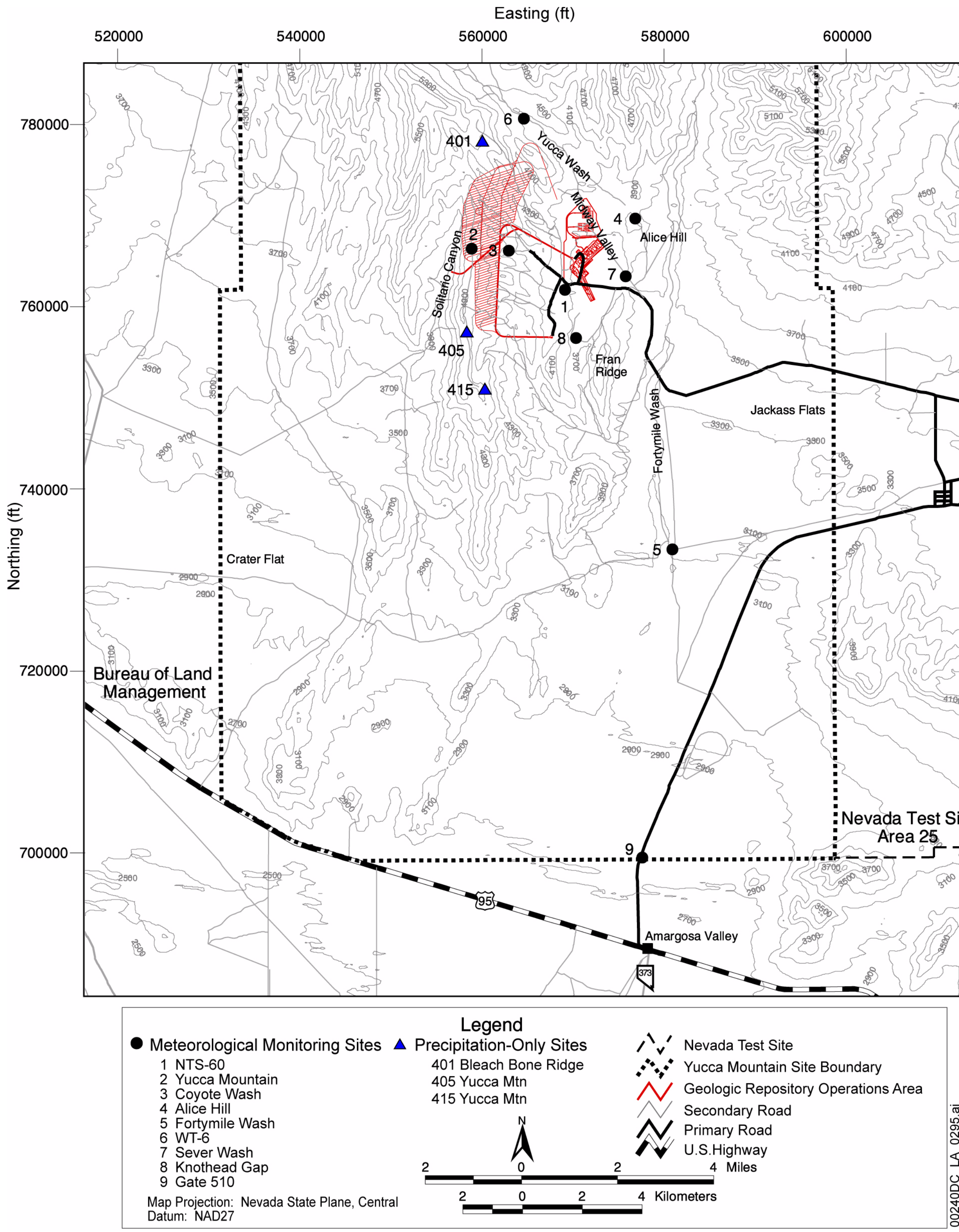

Figure 5-20. Meteorological Station Locations Used to Represent Yucca Mountain Present-Day Climate Conditions

NOTE: The geologic repository operations area is shown for illustration purposes only.

Source: SNL 2006, Figure 4-1.1; NCDC 1998.

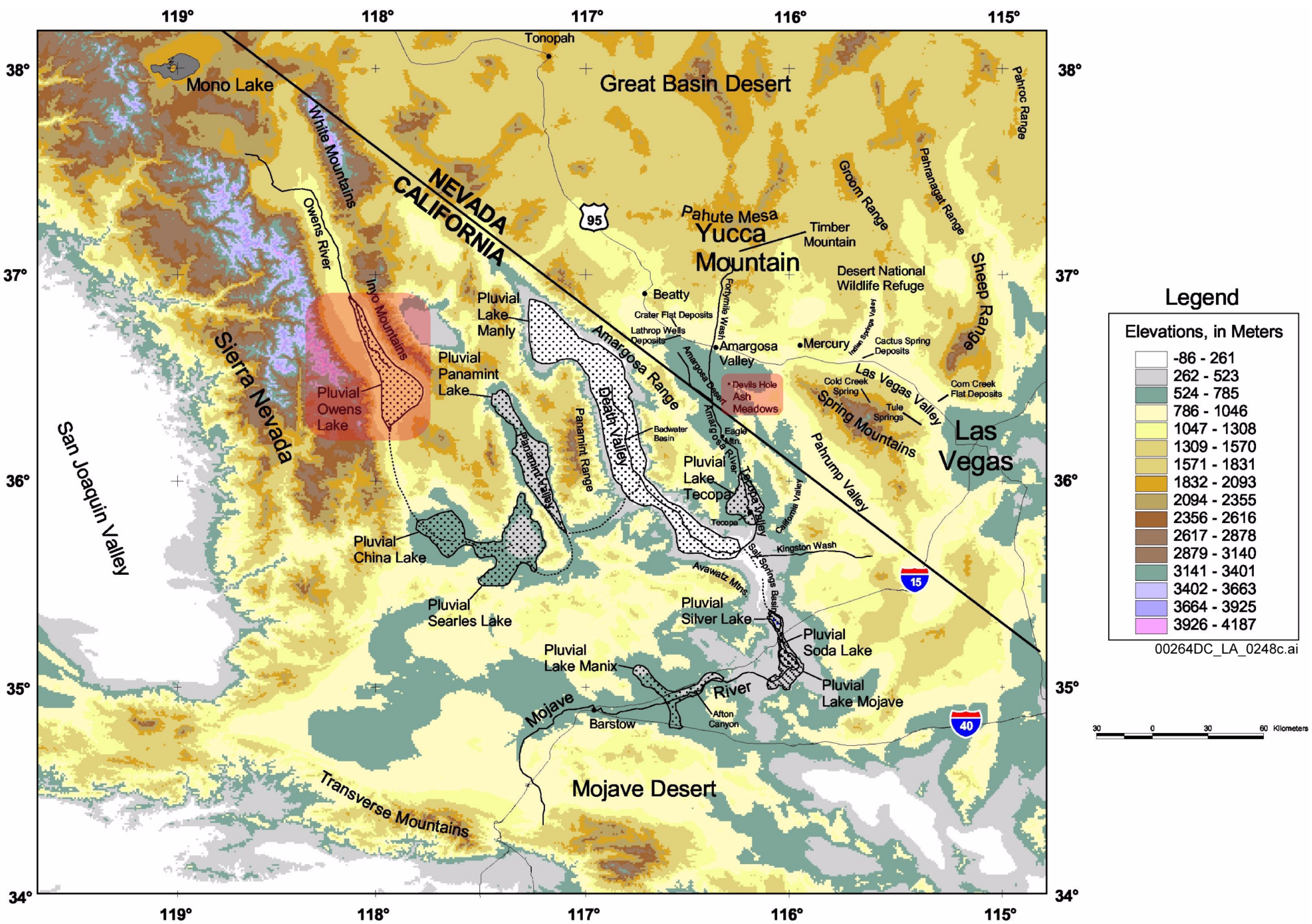

Figure 5-21. Localities Important to Past and Future Climate Estimates in the Yucca Mountain Region

Note: Both modern playa lakes and Pleistocene pluvial lakes are shown because they are important to past and future climate estimates. Refer to text for discussions of their use.

Source: BSC 2004a, Figure 6-1.

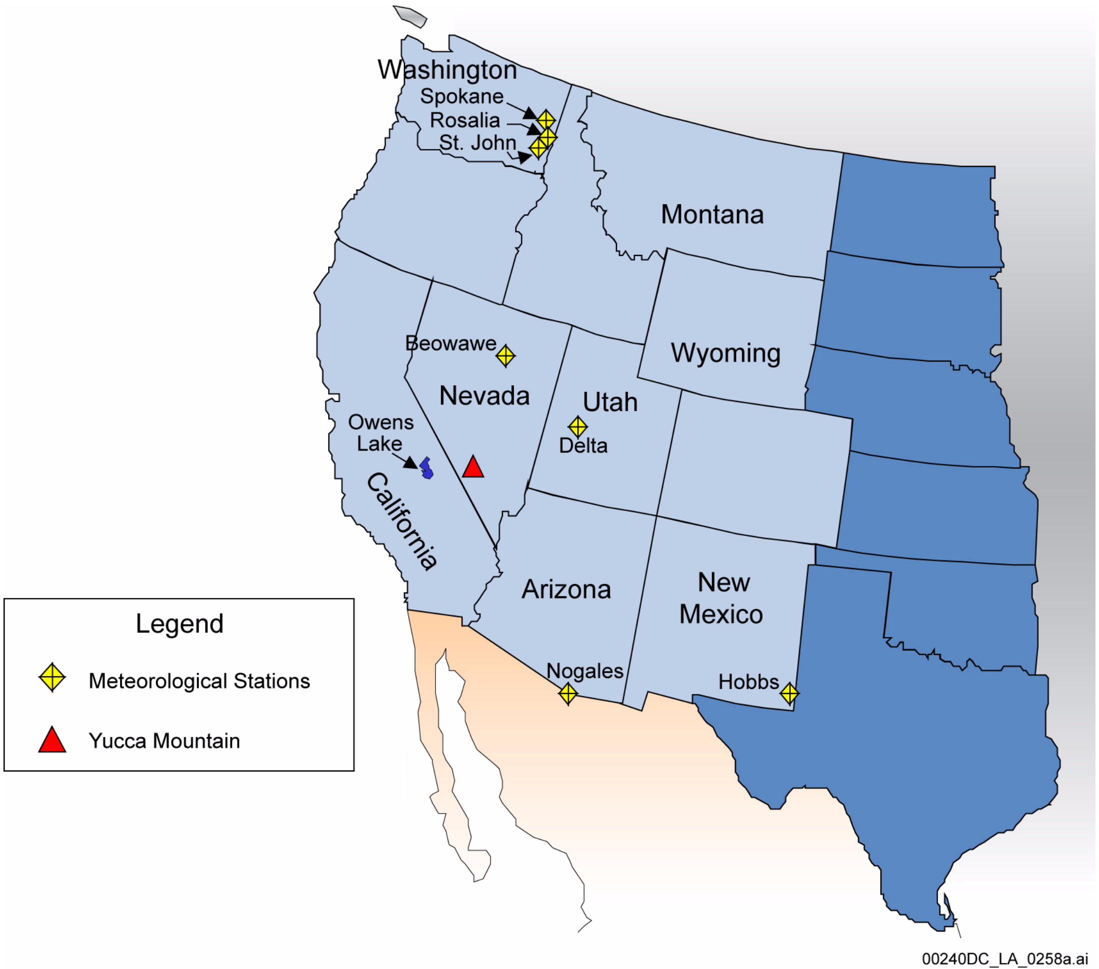

Figure 5-22. Present-Day Meteorological Stations Used as Future Climate Analogues

Source: BSC 2004a, Figure 6-8.

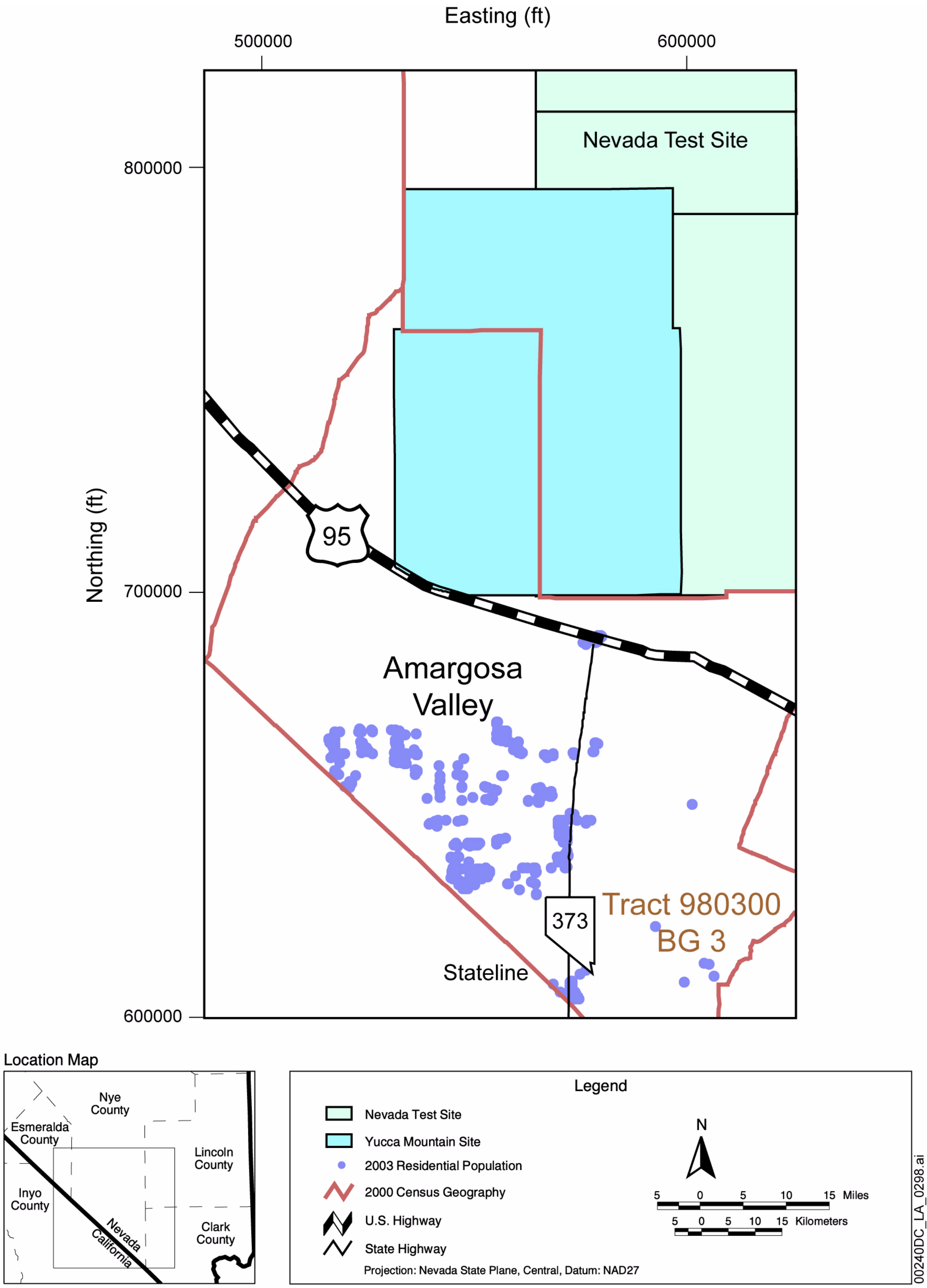

Figure 5-23. Population Distribution within the Amargosa Valley

Source: BSC 2003, Figure 1.

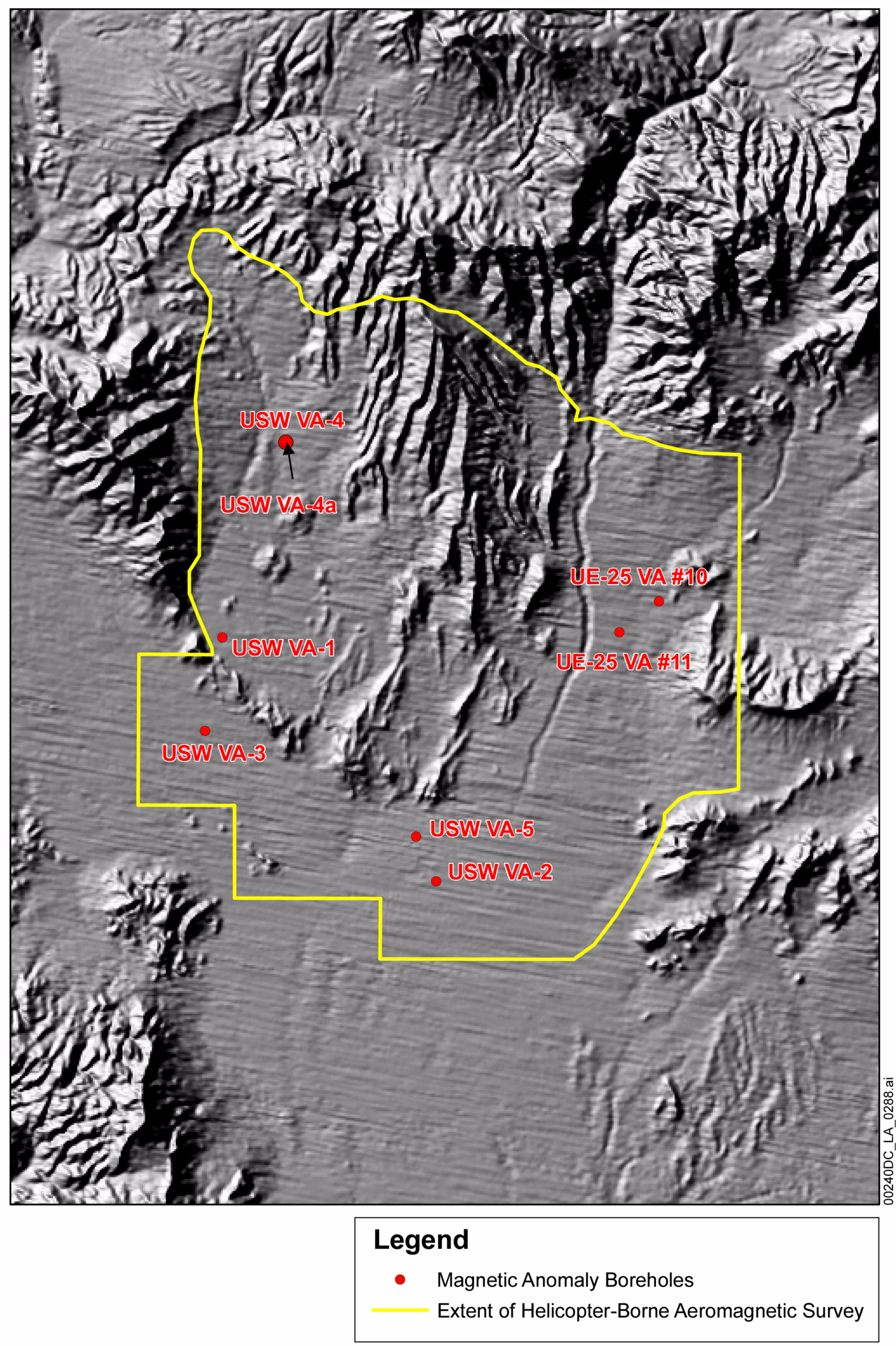

Figure 5-24. Magnetic Survey and Anomaly Confirmation Boreholes Map in the Yucca Mountain Region

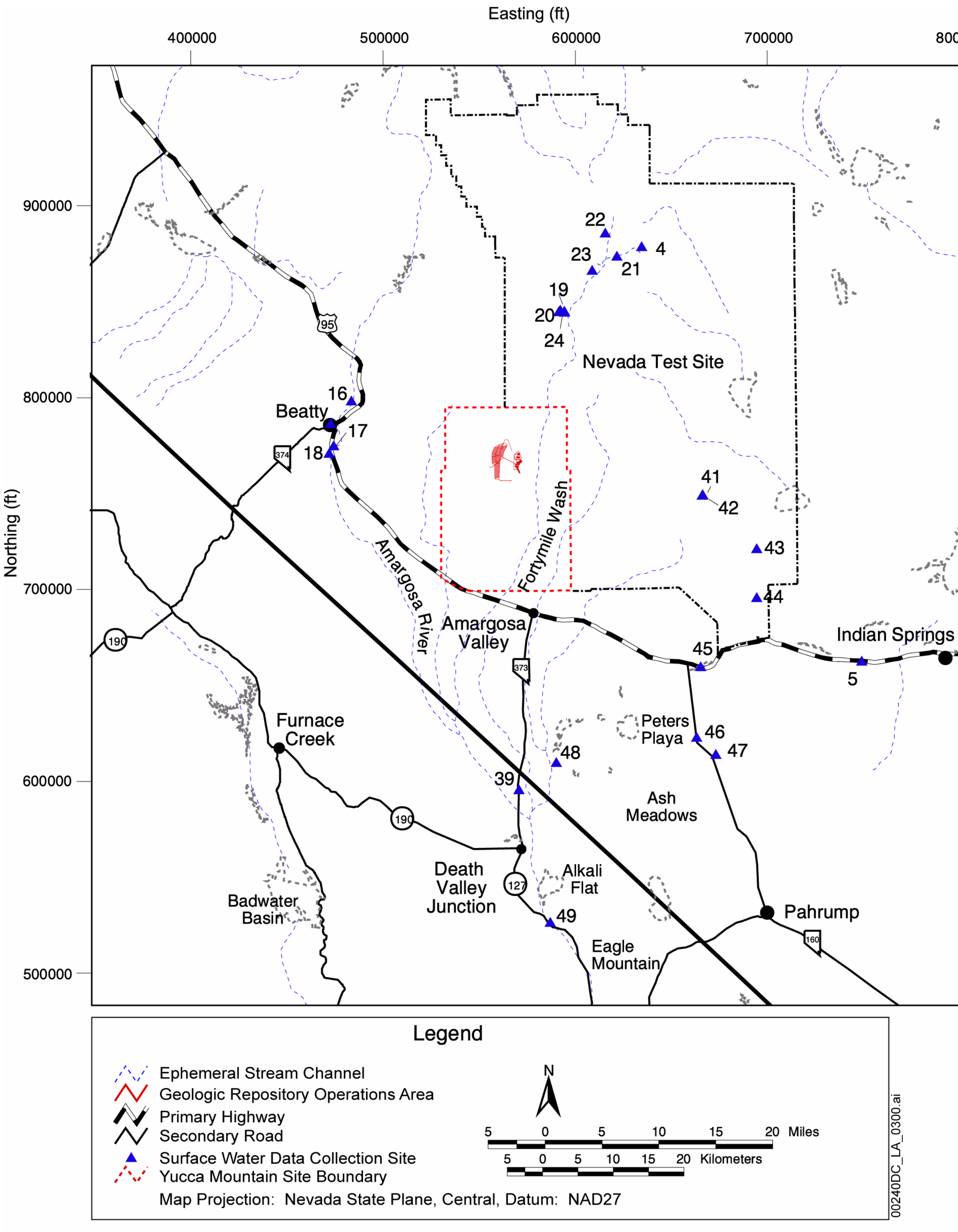

Figure 5-25. Surface Water Data Collection Sites Near Yucca Mountain

NOTE: The geologic repository operations area is shown for illustration purposes only. See Figure 5-9 for surface water data collection sites in the Yucca Mountain vicinity.

Source: BSC 2004a, Figure 7-5a.

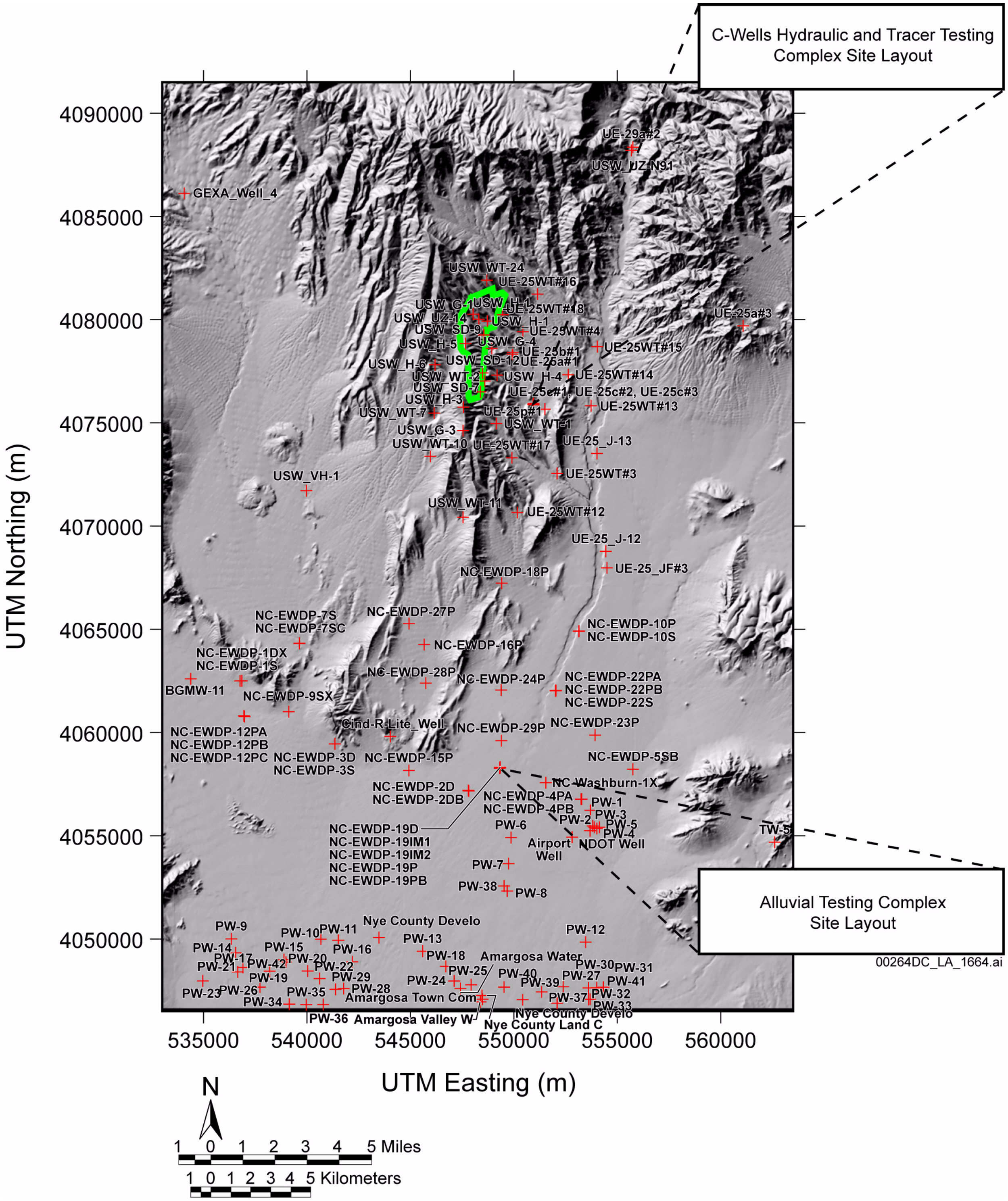

Figure 5-26. Location of the C-Wells, Nye County Early Warning Drilling Program Wells, and the Alluvial Testing Complex with Designators on all Boreholes

Source: Modified from SNL 2007a, Figures 6.1-1, 6.1-6, 6.1-7, and 6.1-8; BSC 2004d, Figure 1-2.

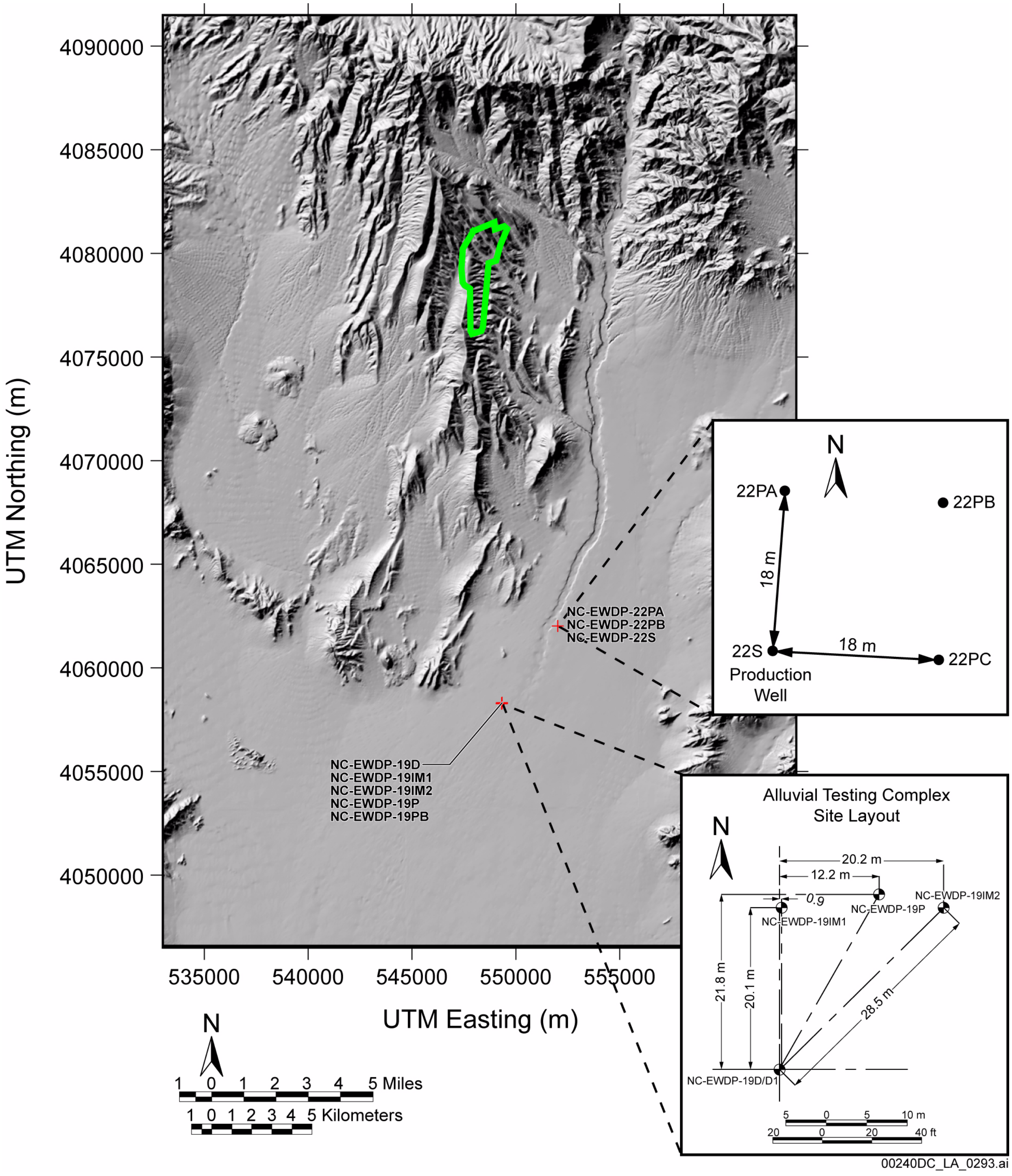

Figure 5-27. Location of the Alluvial Testing Complex and EWDP NC-22 Aquifer Testing Locations

Source: SNL 2007a, Figures 6.1-1, and 6.1-6 to 6.1-8.

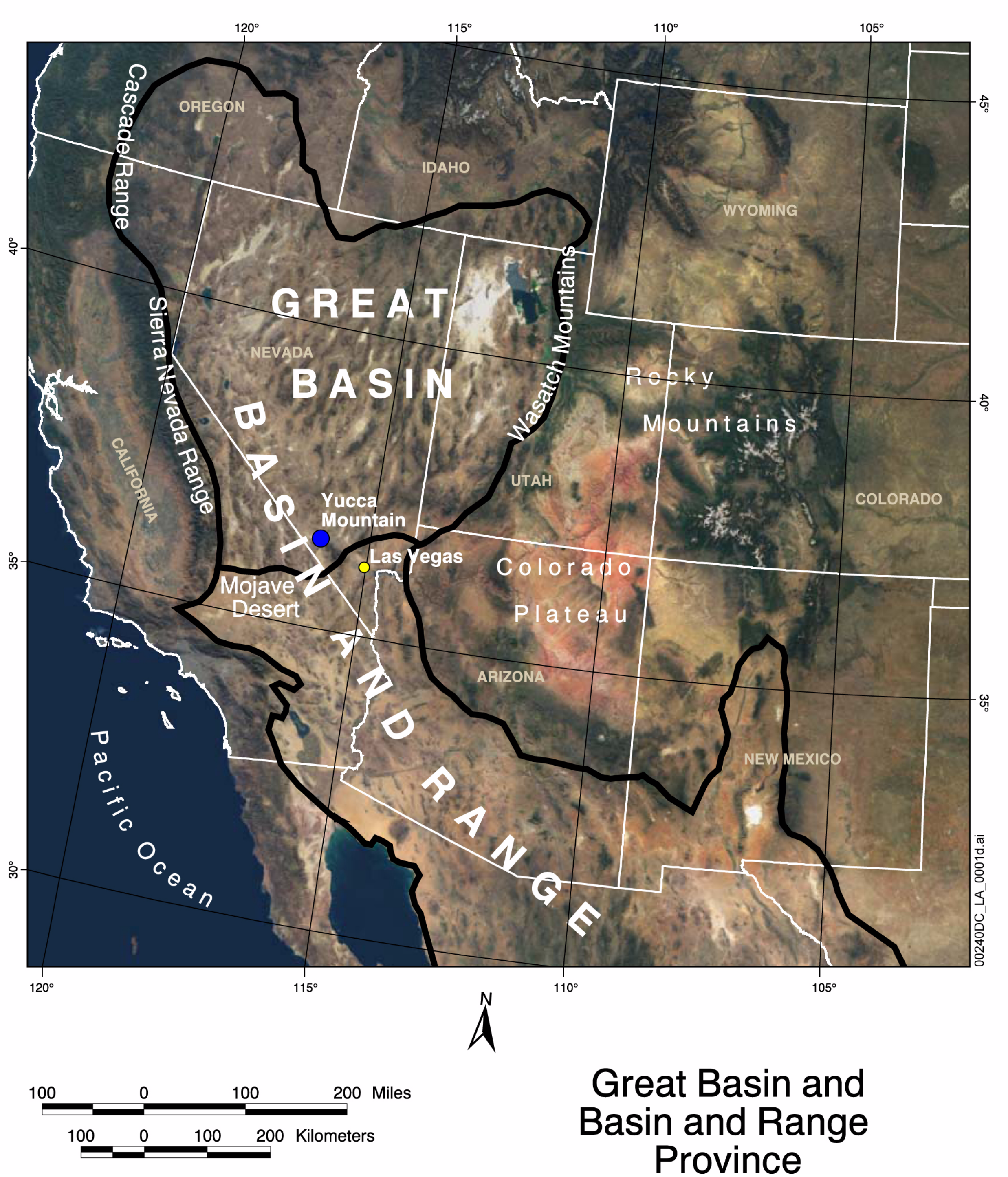

Figure 5-28. Map Showing the Location of Yucca Mountain and Major Physiographic Provinces of the Southwest

Source: BSC 2004a, Figure 2-1a.

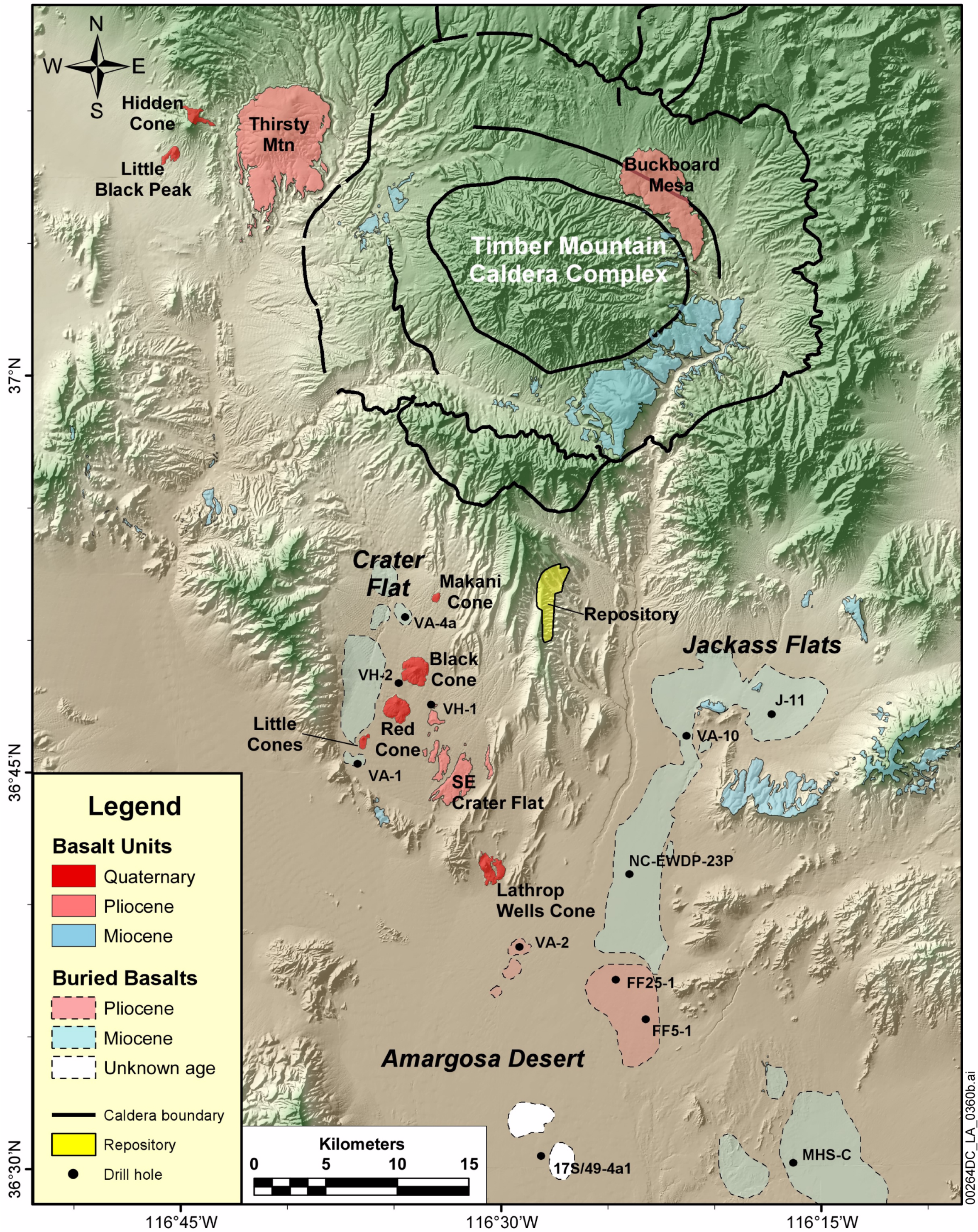

Figure 5-29. Locations and Ages of Post-Miocene (Less than 5.3 Ma) Volcanoes (or Clusters Where Multiple Volcanoes Have Indistinguishable Ages) in the Yucca Mountain Region

Source: Based on information presented in Slate et al. 2000; SNL 2007j, Table 6-2; Fleck et al. 1996; Perry et al 1998; Heizler et al. 1999.

Lithostratigraphic Unit		Major Hydrogeologic Unit	Detailed Hydrogeologic Unit	Unsaturated Zone Model Layer	Thermal-Mechanical Units	
Alluvium and Colluvium	Qal, Qc	Unconsolidated Surface Material			Undifferentiated Overburden (UO)	
Rainier Mesa Tuff	Tmr					
Pre-Rainier Mesa Tuff bedded tuff						
Rhyolite of Comb Peak						
Tuff Unit "X"						
Rhyolite of Vent Pass						
Post-Tiva Canyon Tuff bedded tuff						
Tiva Canyon Tuff	Tpcr	Tiva Canyon welded (TCw)	CCR, CUC	tcw11	Tiva Canyon welded (TCw)	
	Tpcp		CUL, CW	tcw12		
	Tpcpv3		CMW	tcw13		
	Tpcpv2	Paintbrush nonwelded (PTn)			Paintbrush nonwelded (PTn)	
	Tpcpv1		CNW	ptn21		
Bedded Tuff	Tpbt4		BT4	ptn22		
Yucca Mountain Tuff	Tpy		TPY	ptn23		
Bedded Tuff	Tpbt3		BT3	ptn24		
Pah Canyon Tuff	Tpp		TPP	ptn25		
Bedded Tuff	Tpbt2		BT2	ptn26		
Topopah Spring Tuff	Tptrv3					
	Tptrv2					
	Tptrv1	Topopah Spring welded (TSw)	TC	tsw31	Topopah Spring welded, "lithophysae rich" (TSw1)	
	Tptrn		TR	tsw32		
	Tptrl		TUL	tsw33		
	Tptpul					Approximate Repository Horizon
	Tptpmn		TMN	tsw34	Topopah Spring welded, "lithophysae poor" (TSw2)	
	Tptpll		TLL	tsw35		
	Tptpln		TM2 (upper 2/3)	tsw36		
			TM1 (lower 1/3)	tsw37		
	Tptpv3		PV3	tsw38	Topopah Spring welded, vitrophyre (TSw3)	
	Tptpv2	Calico Hills nonwelded (CHn)	PV2	tsw39	Calico Hills nonwelded (CHn1)	
	Tptpv1		BT1 or BT1 (altered)	ch1 (vit, zeo)		
Bedded Tuff	Tpbt1					
Calico Hills Formation	Tac		CHV (vitric) or CHZ (zeolitic)	ch2 (vit, zeo)		
				ch3 (vit, zeo)		
				ch4 (vit, zeo)		
				ch5 (vit, zeo)		
Bedded Tuff	Tacbt		BT	ch6	Calico Hills nonwelded (CHn2)	
Prow Pass Tuff	Tcpuv		PP4 (zeolitic)	pp4	"Calico Hills" nonwelded (CHn3)	
	Tcpuc		PP3 (devitrified)	pp3	Prow Pass welded (PPw)	
	Tcpmd		PP2 (devitrified)	pp2		
	Tcplc					
	Tcplv		PP1 (zeolitic)	pp1	Upper Crater Flat nonwelded (CFUn)	
Bedded Tuff	Tcpbt					
Bullfrog Tuff	Tcbuv					
	Tcbuc	Crater Flat undifferentiated (CFu)	BF3 (welded)	bf3	Bullfrog welded (BFw)	
	Tcbmd					
	Tcblc					
	Tcblv		BF2 (nonwelded)	bf2	Middle Crater Flat nonwelded (CFMn)	
Bedded Tuff	Tcbbt					
Tram Tuff	Tctuv					
	Tctuc		Not Available	tr3	Tram welded (TRw)	
	Tctmd					
	Tctlc					
	Tctlv & below		Not Available	tr2		

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Figure 5-30. Major Lithostratigraphic Unit, Hydrogeologic Unit, Detailed Hydrogeologic Unit, Unsaturated Zone Model Layer, and Thermal-Mechanical Unit Nomenclatures

Source: DOE 2002a, Table 4-4; DOE 2002c, Figure 3-21; Ortiz et al. 1985; Engstrom and Rautman 1996; BSC 2004l, Table 6-5; BSC 2007a, Table 6-1.

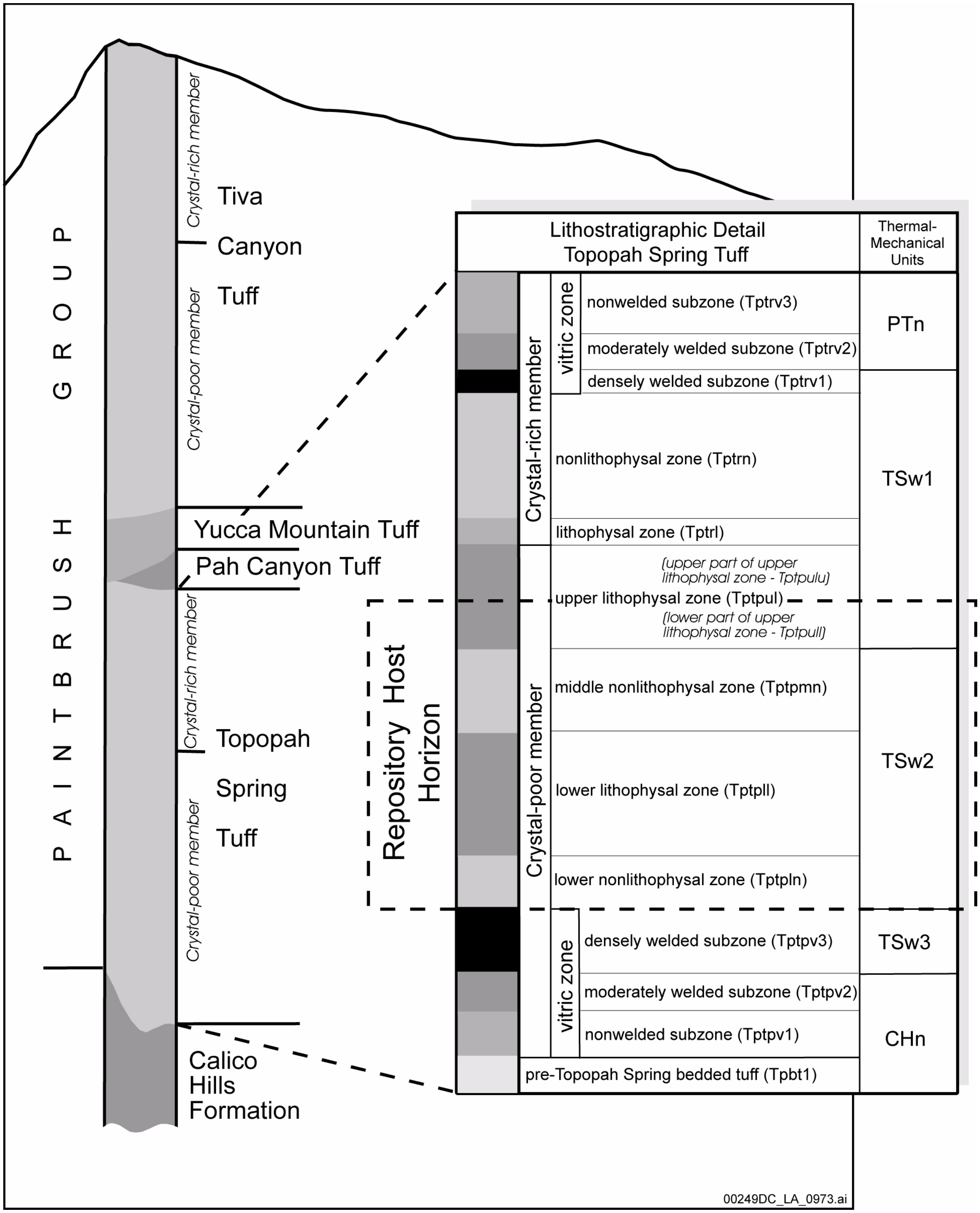


Figure 5-31. Stratigraphic Column with Lithostratigraphic Detail for the Repository Host Horizon

Source: BSC 2007a, Figure 6-1.

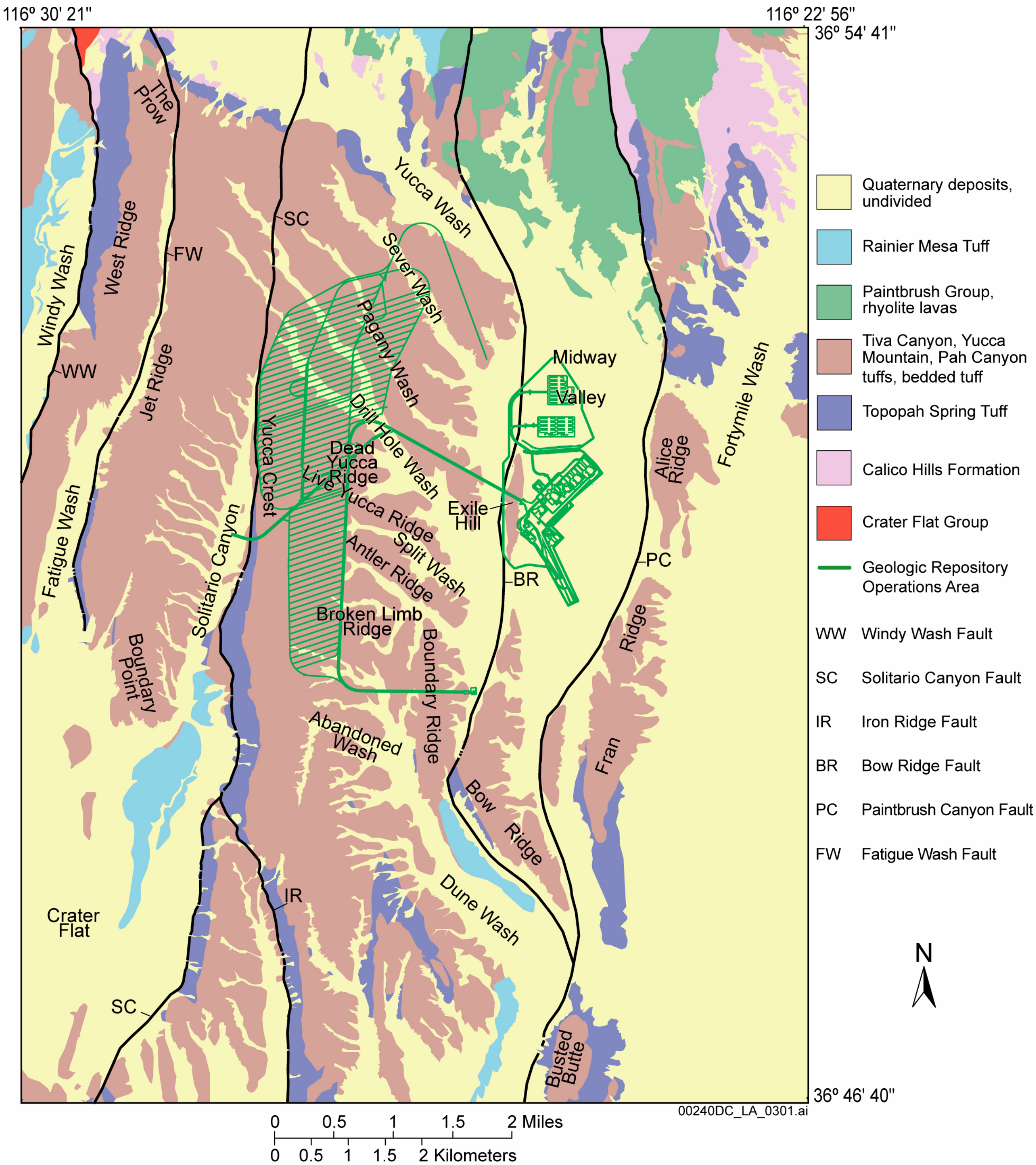


Figure 5-32. Generalized Geologic Map of Yucca Mountain Repository Area

NOTE: Major faults are shown with solid lines, although large segments of some are concealed or inferred beneath Quaternary deposits. The geologic repository operations area is shown for illustration purposes only.

Source: Potter et al. 2002.

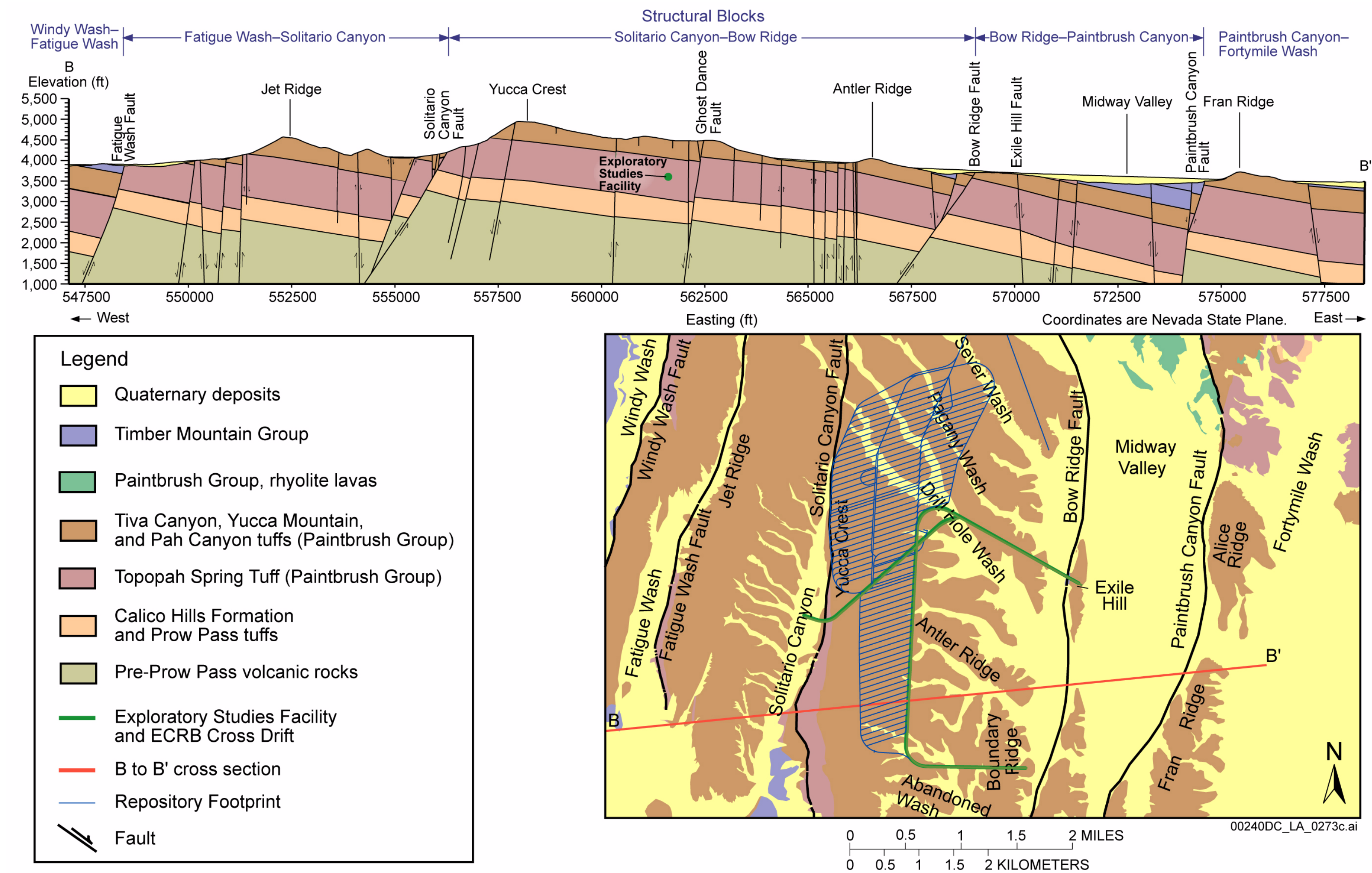


Figure 5-33. Approximate East–West Geologic Section across Yucca Mountain Site Area (top) along Line of Cross Section in Plan View (bottom)

Source: Day et al. 1998, cross section B-B′; Potter et al. 2002, plan view.

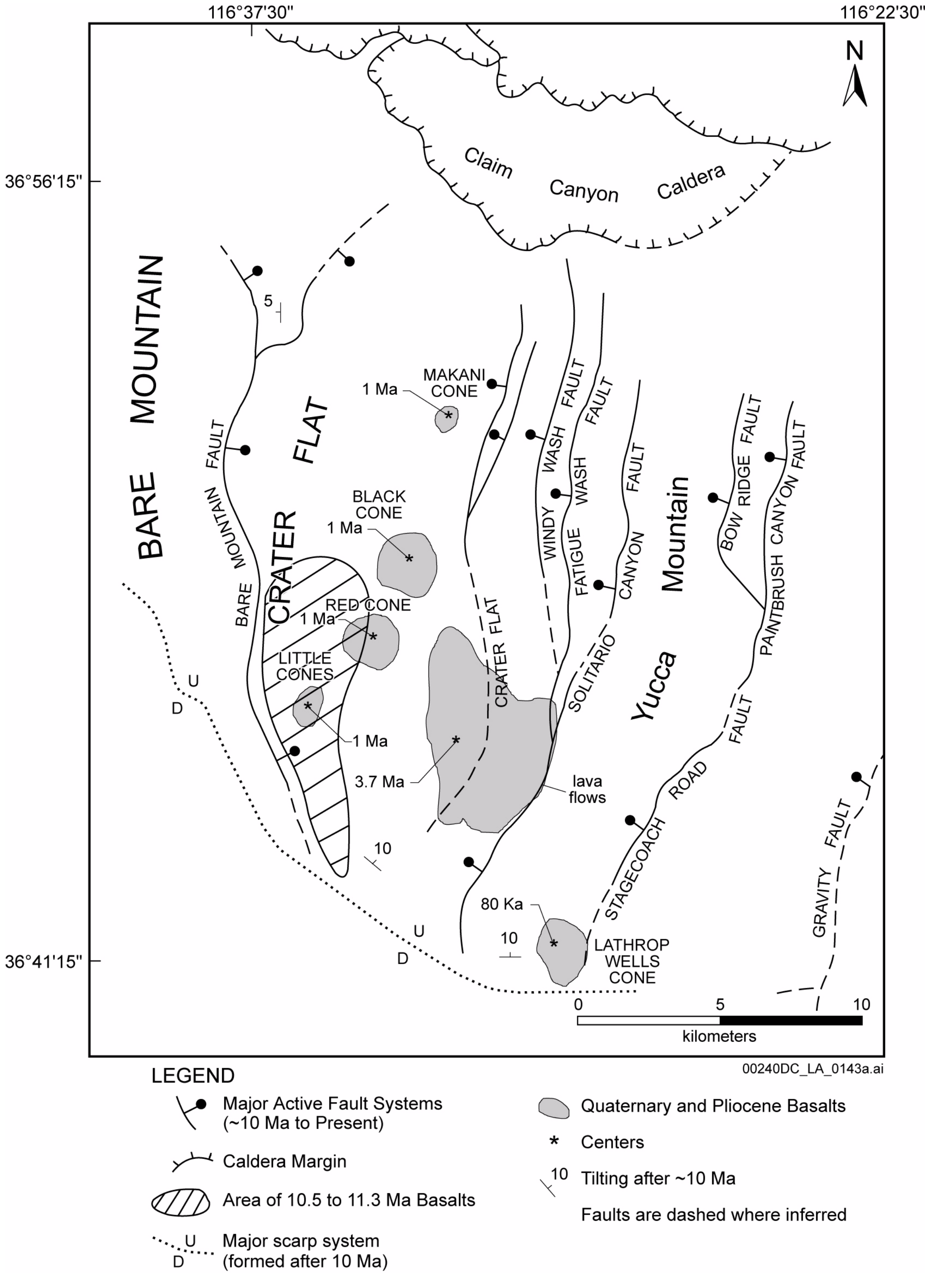


Figure 5-34. Selected Structural Features near Yucca Mountain

NOTE: Bar and ball symbols for faults are shown on downthrown side. Areal extent of 10.5 and 11.3 Ma basalts in southwestern Crater Flat is uncertain.

Source: Modified from Fridrich 1999, Figures 11 and 12.

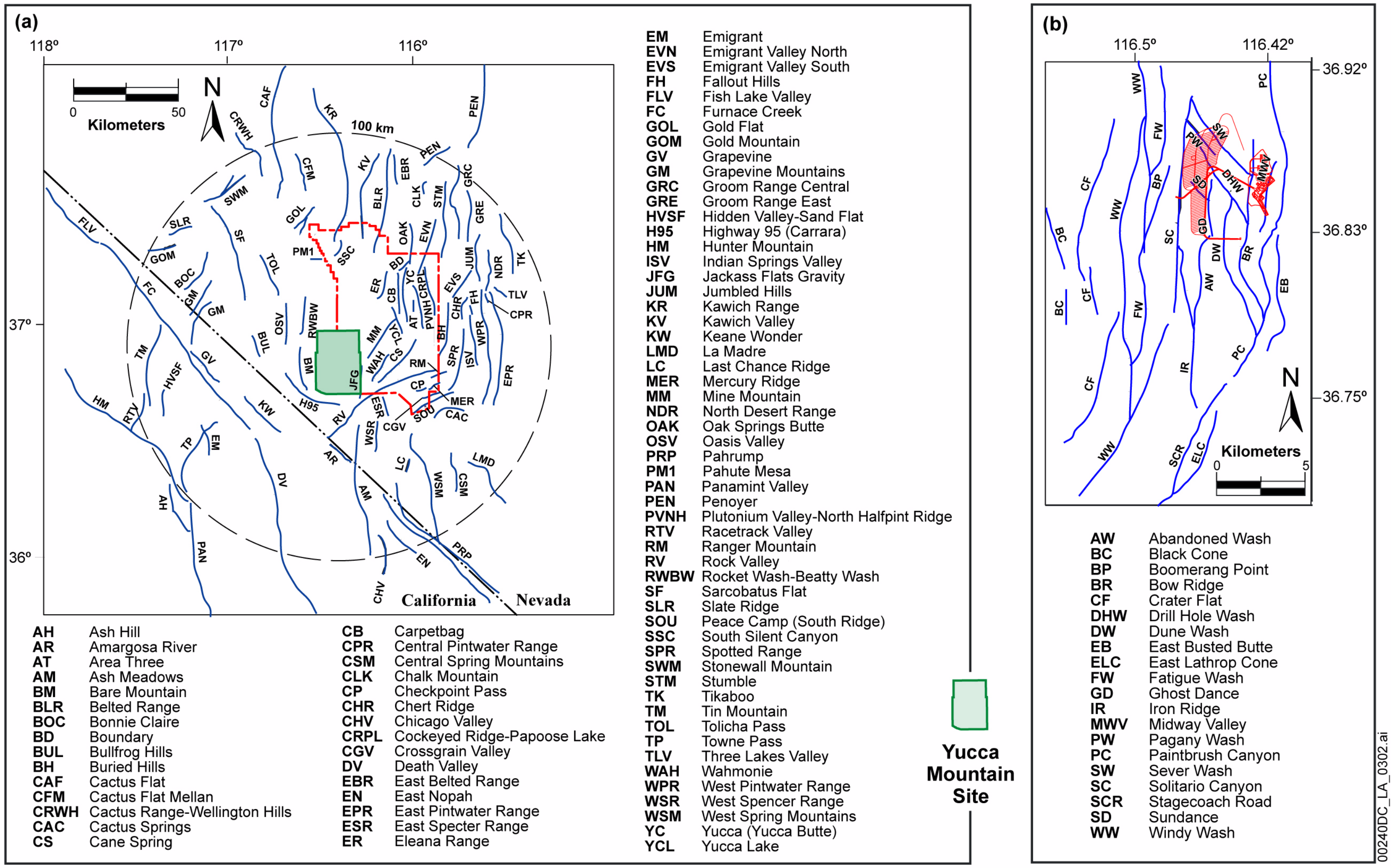
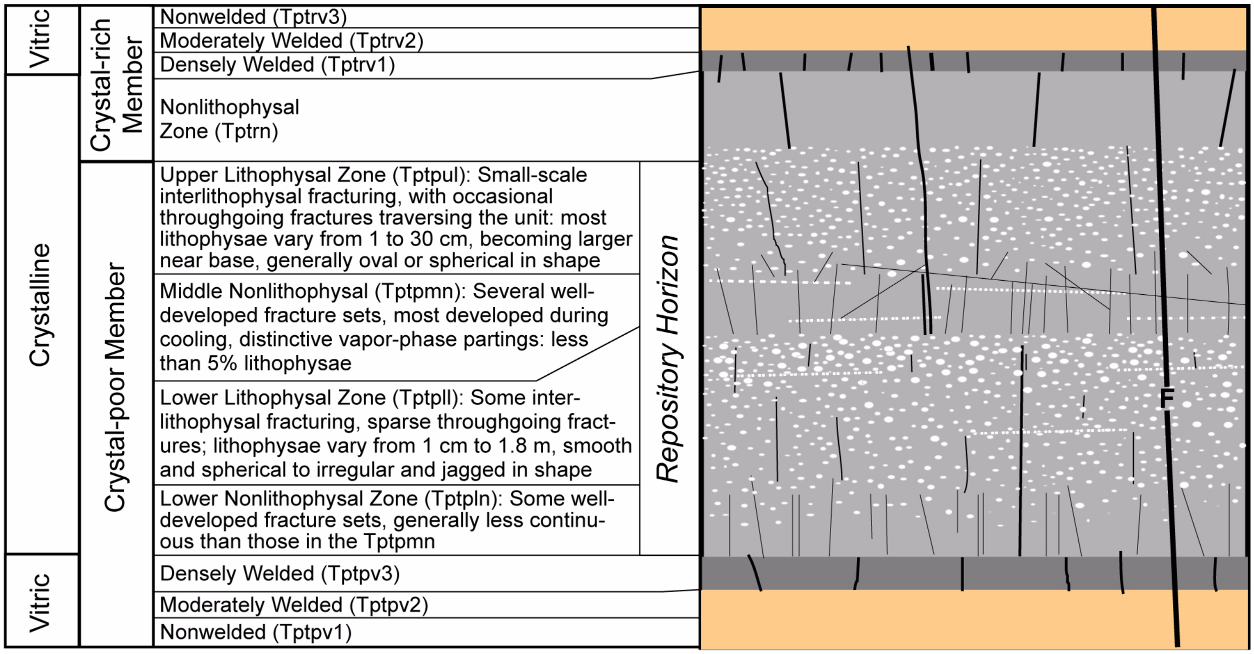


Figure 5-35. Known or Suspected Quaternary Faults and Other Notable Faults in the Yucca Mountain Region

NOTE: (a) Known or suspected Quaternary faults within 100 km of Yucca Mountain. (b) Detail of (a) showing known or suspected faults near Yucca Mountain. Note that the geologic repository operations area is shown for illustration purposes only.

Source: BSC 2004a, Figure 4-23.



Diagrammatic Cross Section of the Topopah Spring Tuff Illustrating Relative Discontinuity Densities and Orientations: This figure indicates how fractures, faults, and lithophysae are typically distributed through the ignimbrite.

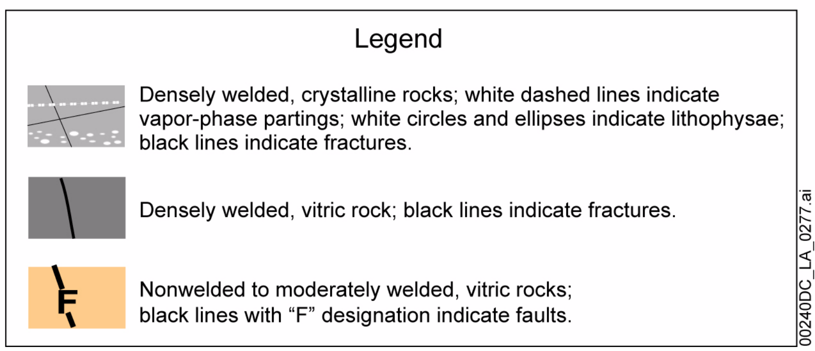


Figure 5-36. Schematic Illustration of the Structure of the Topopah Spring Tuff

Source: Modified from *Drift Degradation Analysis* (BSC 2004h, Figure 6-4).

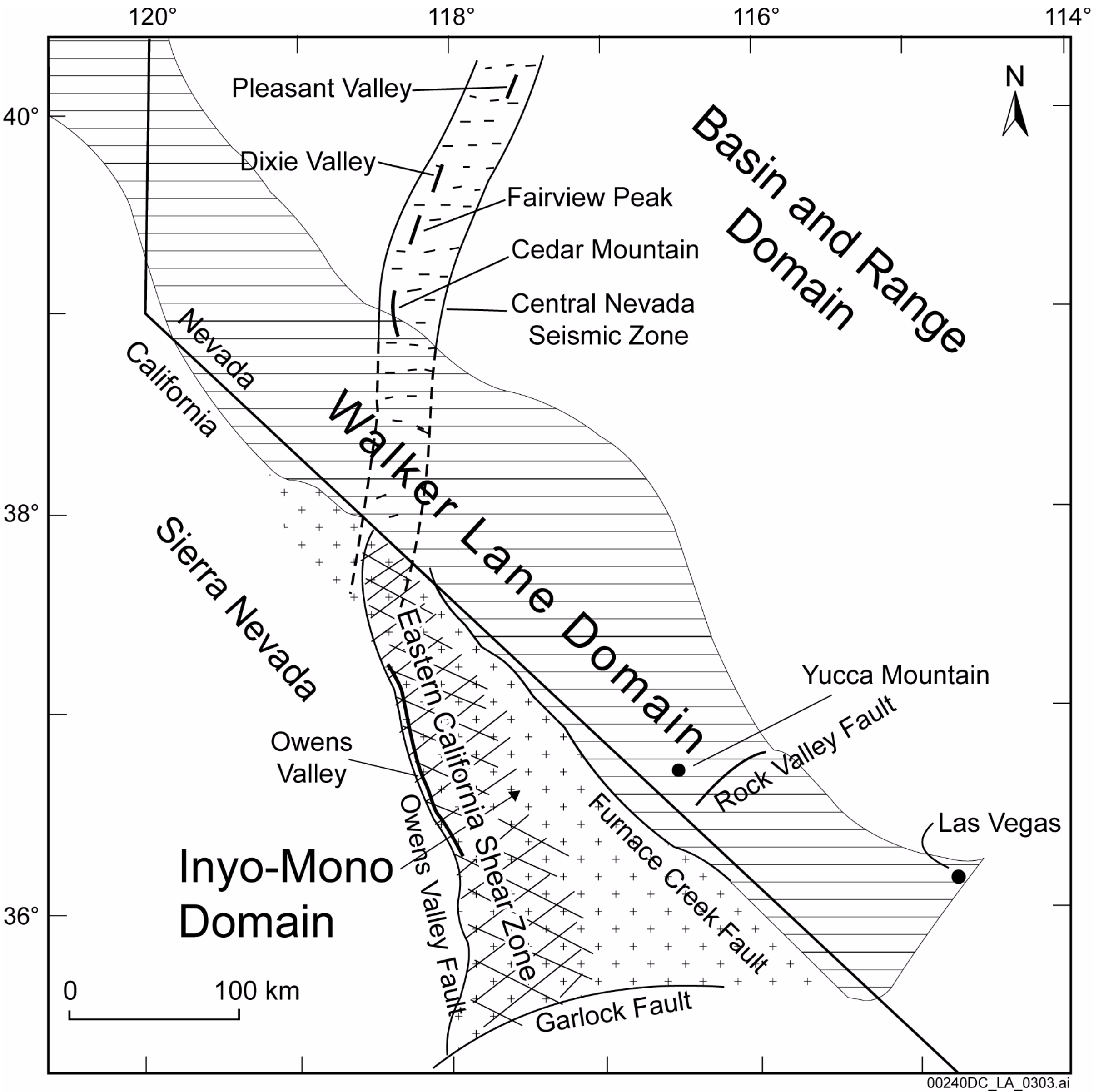


Figure 5-37. Regional Tectonic Domains for Yucca Mountain and Surrounding Environs, Plus Zones of Historical Seismic Activity

Source: BSC 2004a, Figure 2-3.

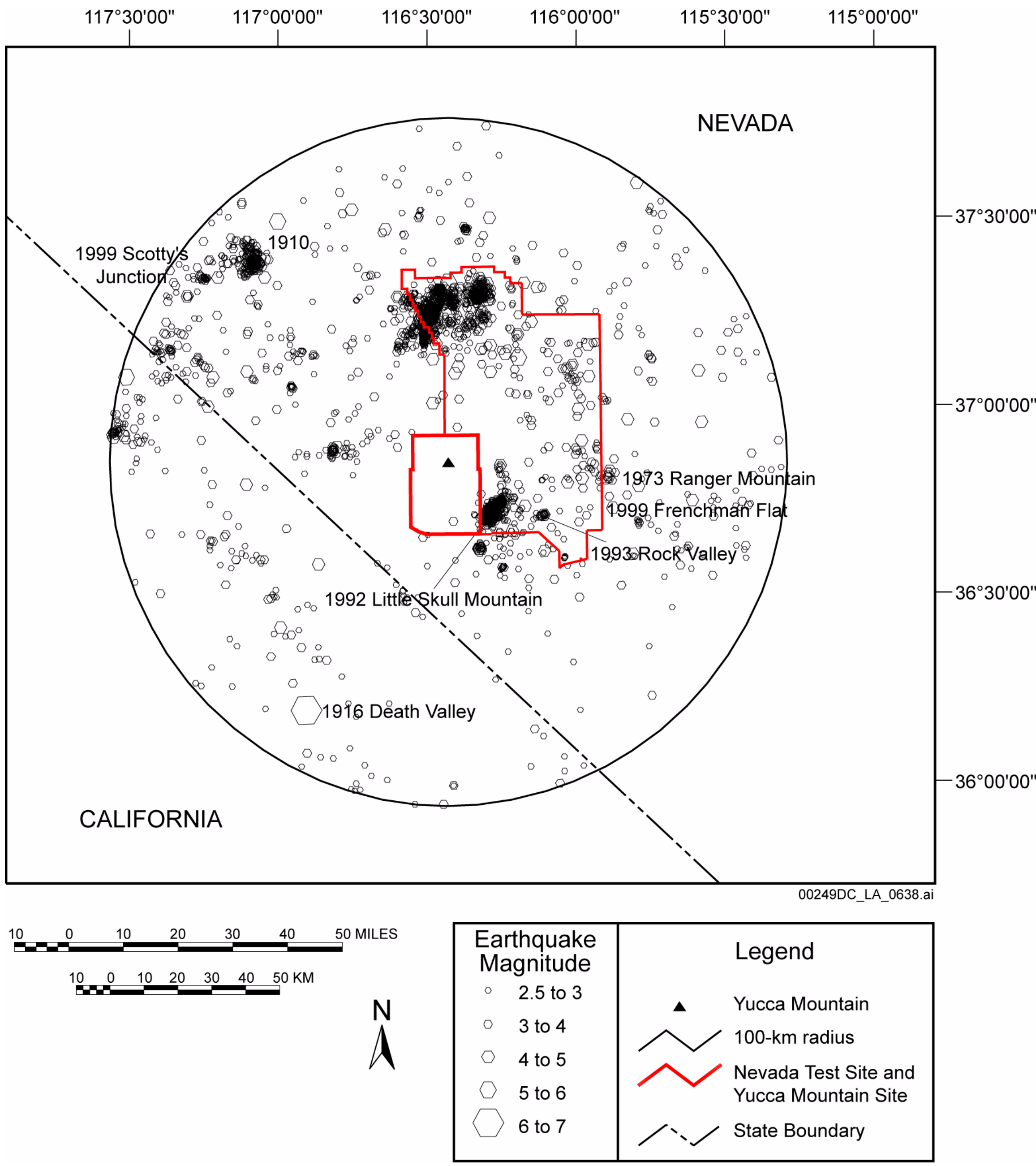


Figure 5-38. Historical Earthquake Epicenters within 100 km of Yucca Mountain

NOTE: Shown are earthquakes from 1904 to 1998. Earthquakes associated with the 1999 Scotty's Junction and 1999 Frenchman Flat sequences are also shown. Significant earthquakes or earthquake sequences are shown with years of occurrence.

Source: BSC 2004a, Figure 4-19.

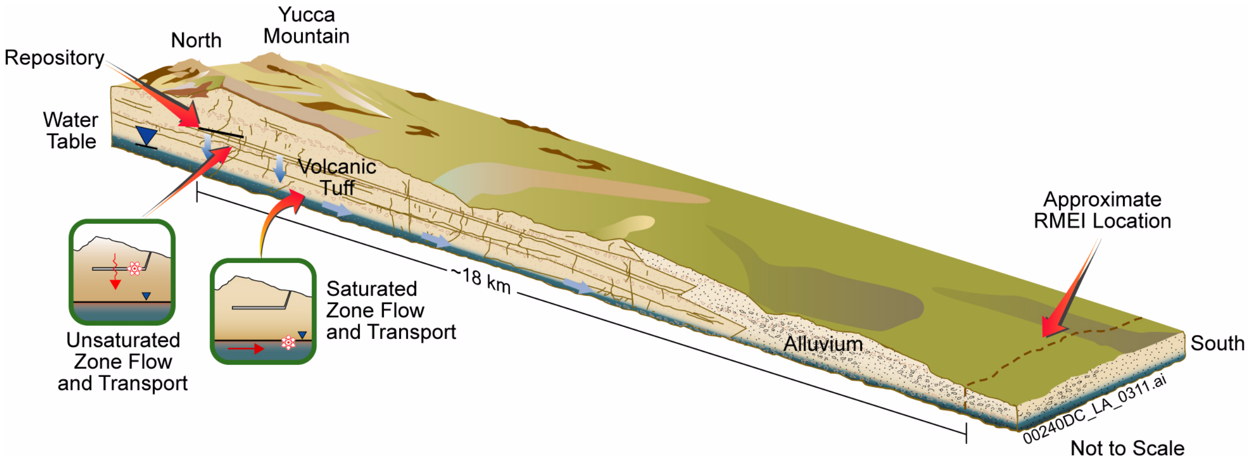


Figure 5-39. Schematic Showing Conceptual Flow Path From the Repository to the Accessible Environment

NOTE: The approximate RMEI location is the southern-most edge of the controlled area at 36°40′13.6661″ North latitude. This is approximately 18 km south of the repository along the predominant direction of groundwater flow.

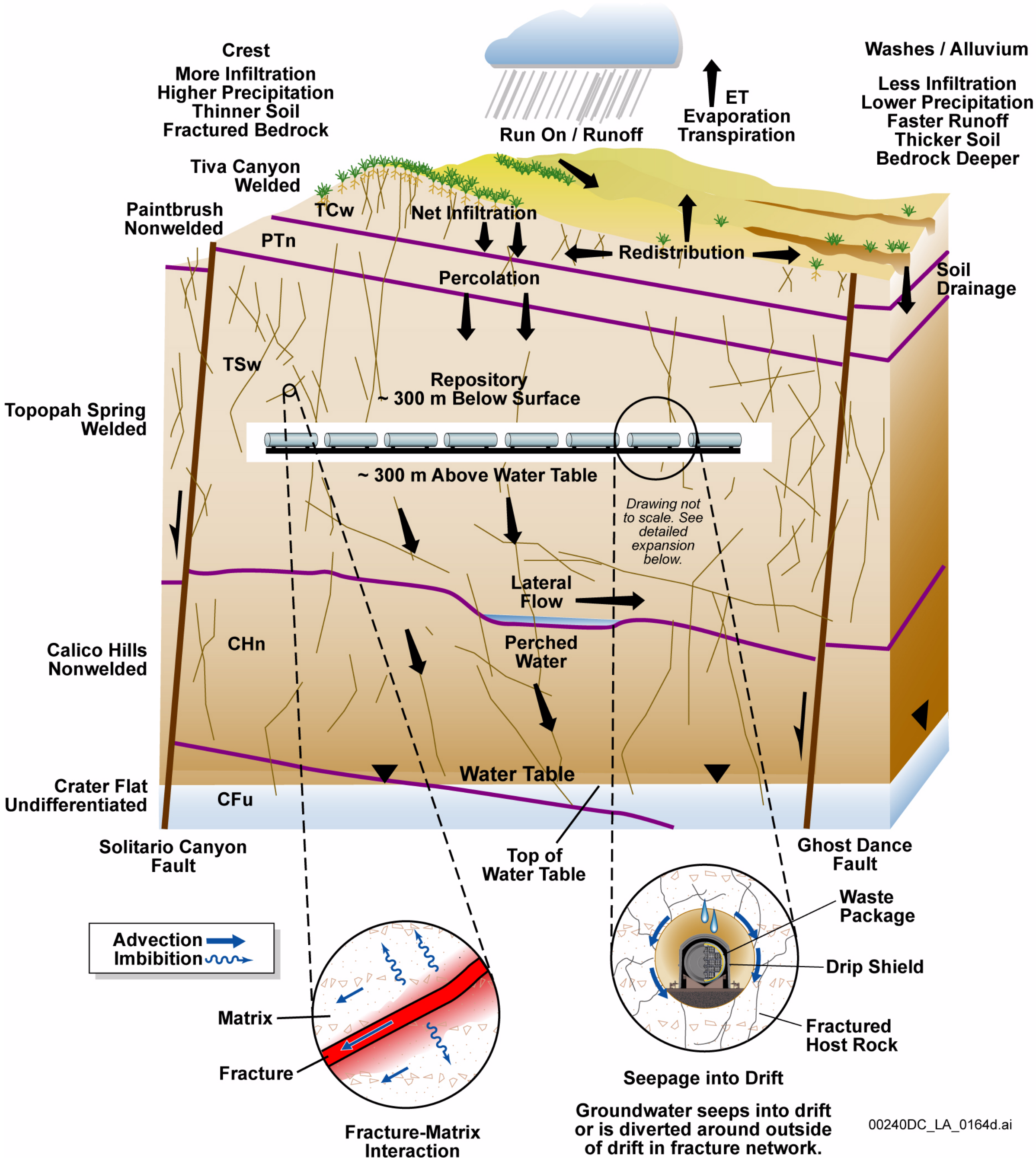


Figure 5-40. Conceptual Drawing of Unsaturated Zone Flow Processes