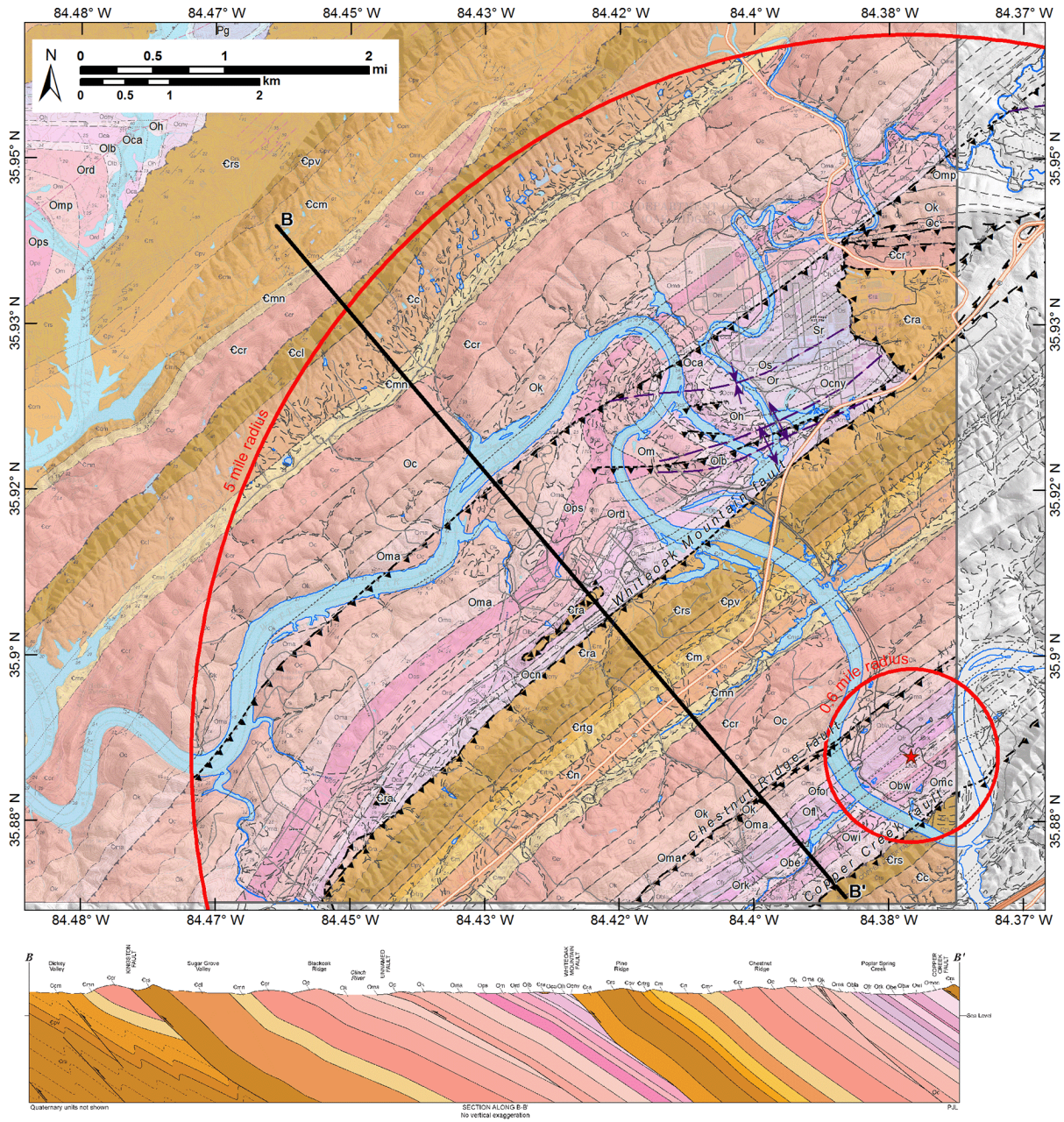


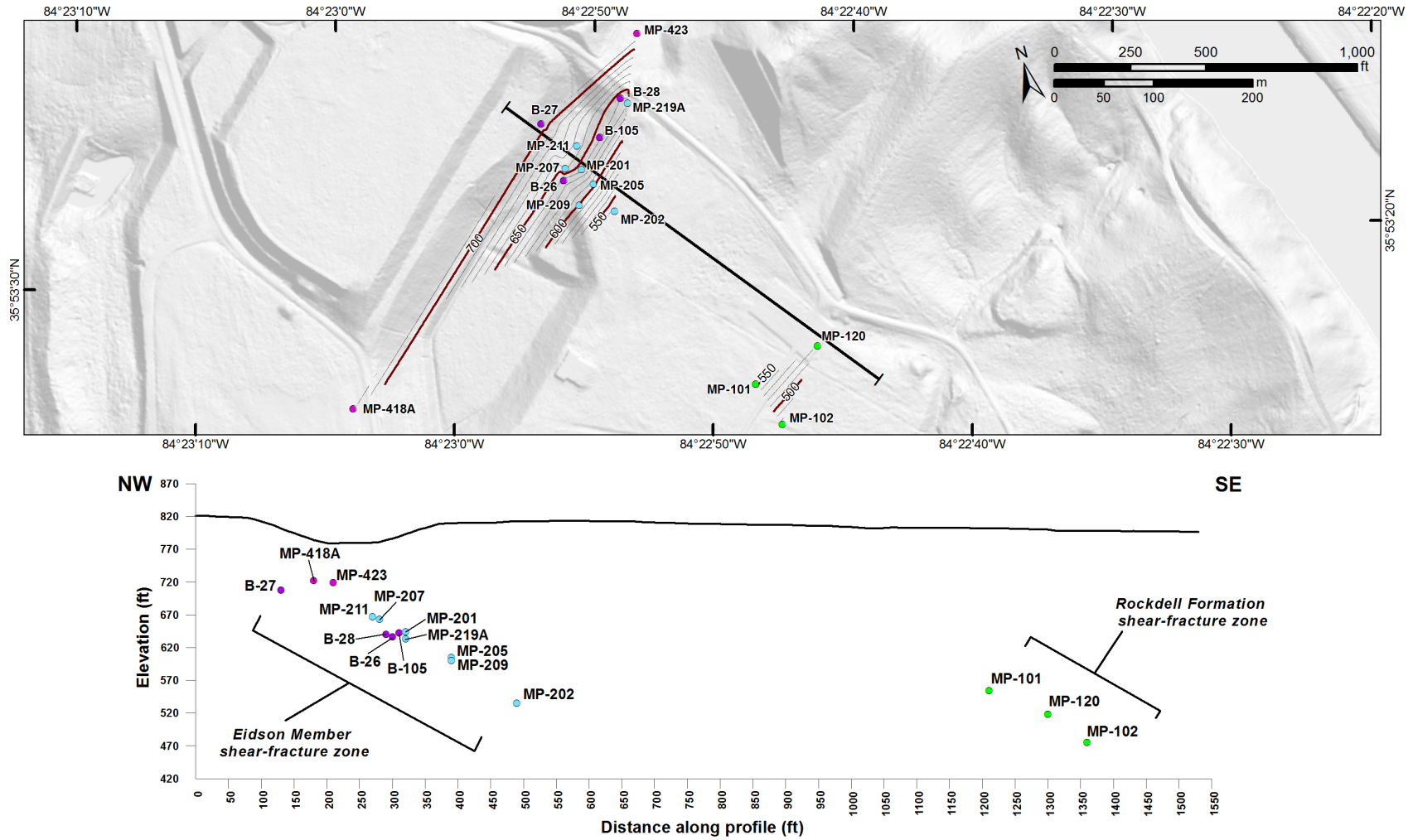
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Source: Reference 2.5.1-282

Figure 2.5.1-64. Geologic Map and Cross Section B-B'

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Notes:  
 See [Table 2.5.1-17](#) for MP-Series boring data. B-series boring data from [Reference 2.5.1-100](#).  
 Geometry of shear-fracture zones are shown on [Figures 2.5.1-66](#) and [2.5.1-67](#).

**Figure 2.5.1-65. (Sheet 1 of 2) Structure Contour Map of Shear Fracture Zones and Associated Profile**



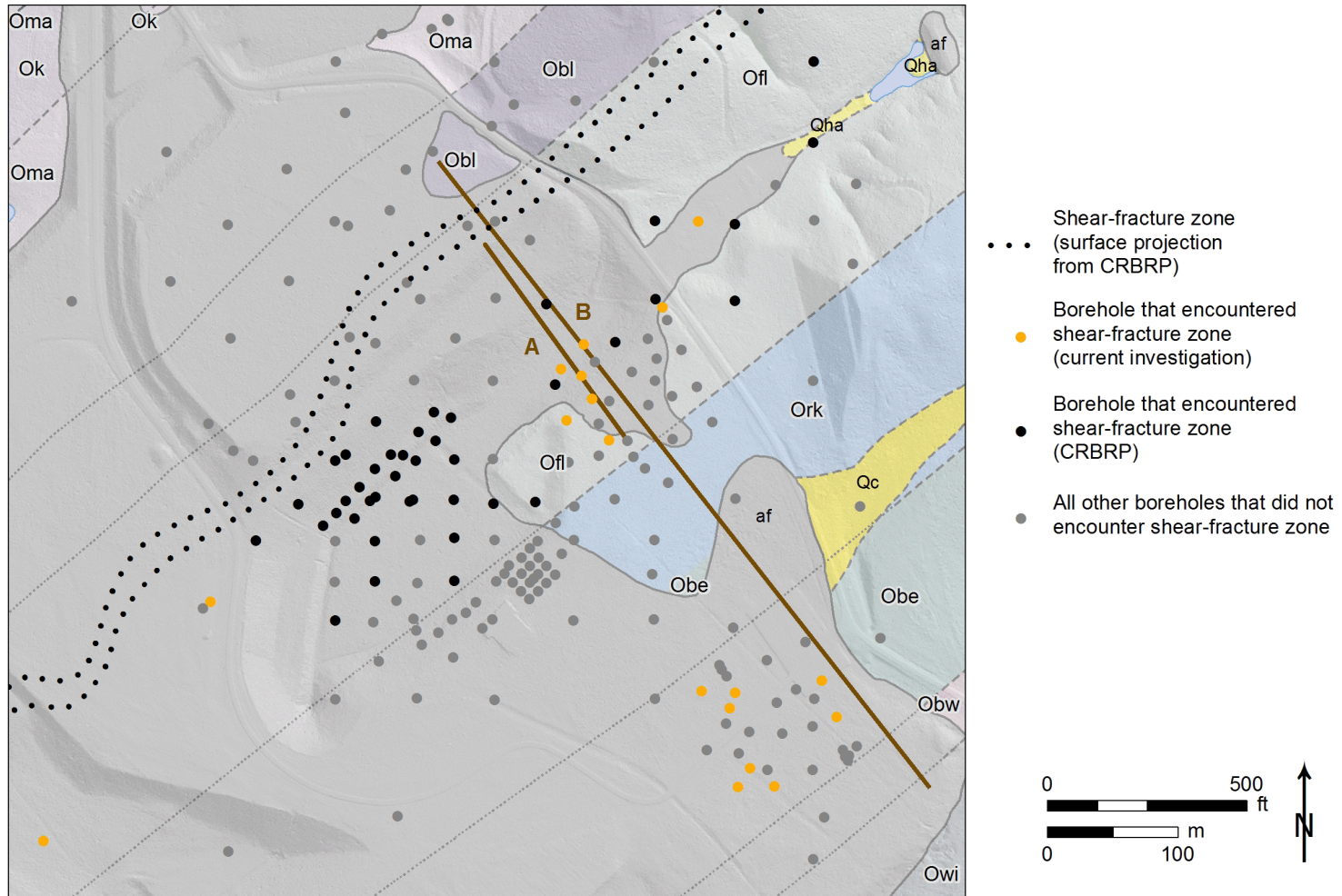
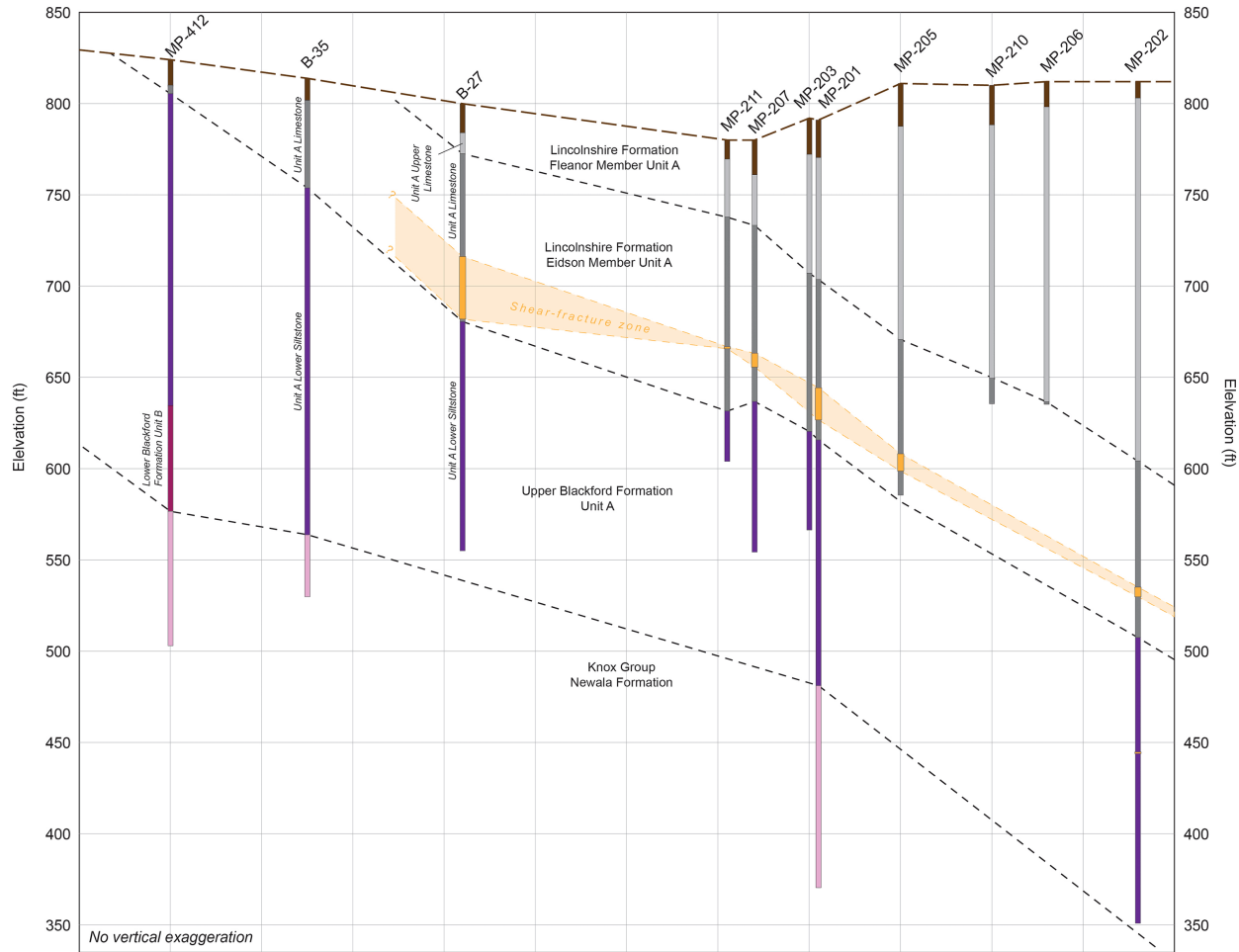


Figure 2.5.1-65. (Sheet 2 of 2) Map of Cross-Section Locations and Boreholes that Encountered Shear Fracture Zones

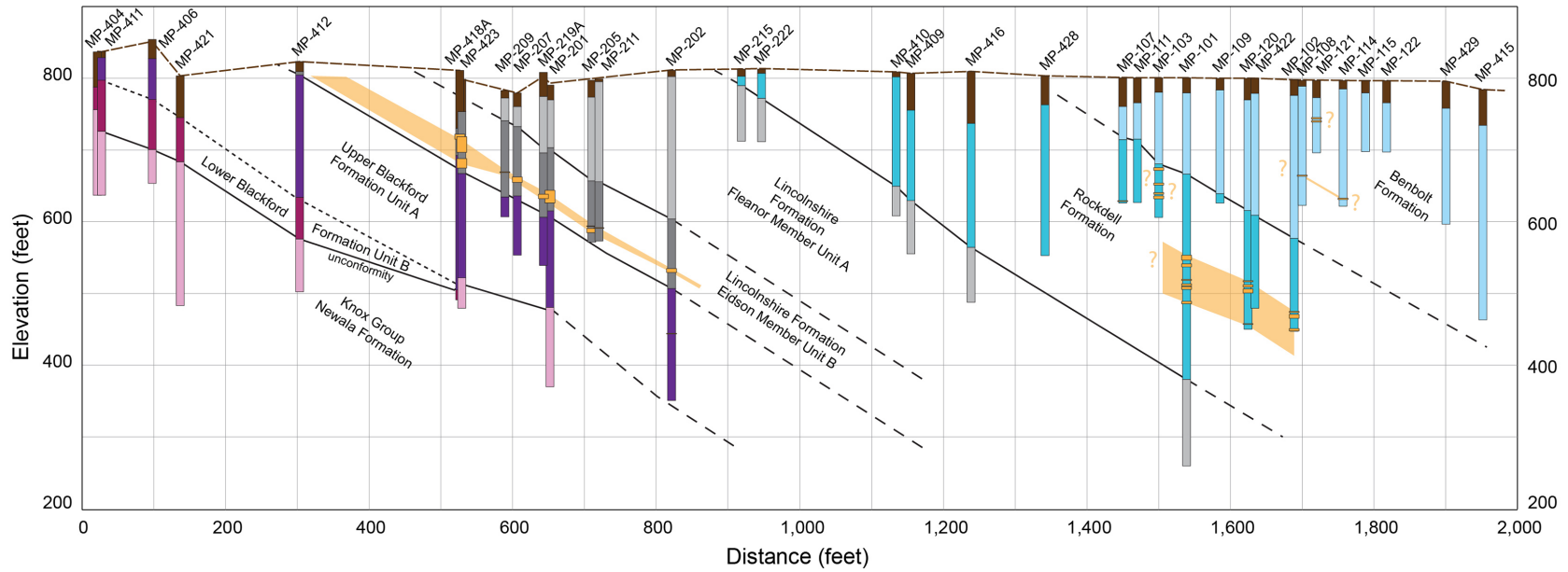
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**Figure 2.5.1-66. Cross-Section through the Shear-Fracture Zone within the Eidson Member of the Lincolnshire Formation (Cross Section Line A in Figure 2.5.1-65)**



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**Figure 2.5.1-67. Cross-Section Through All Shear-Fracture Zone Features (Cross Section Line B in Figure 2.5.1-65)**

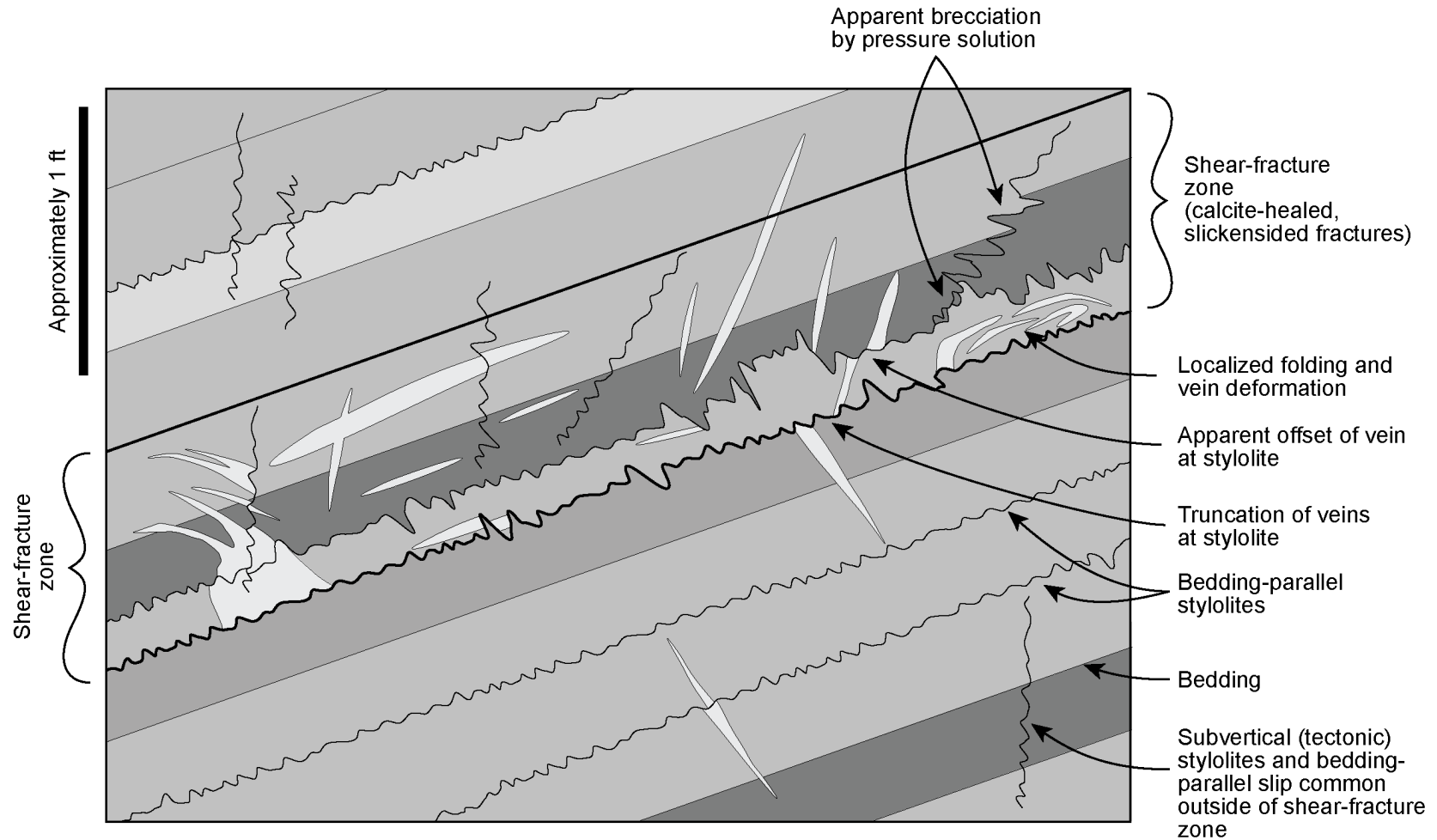
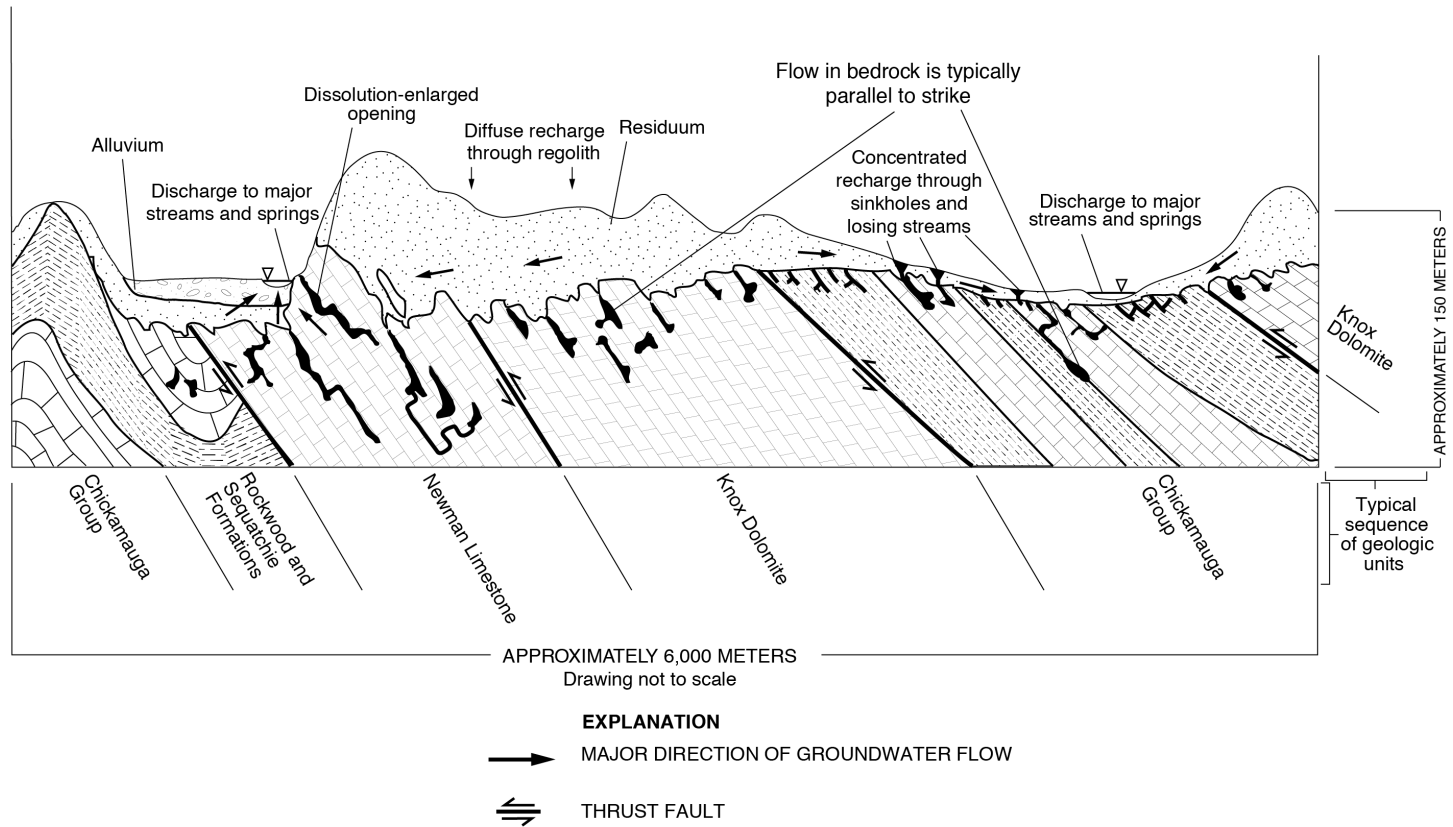


Figure 2.5.1-68. Schematic Diagram of the Crosscutting Relationships Between Bedding, Stylolites, and Shear-Fracture Zones

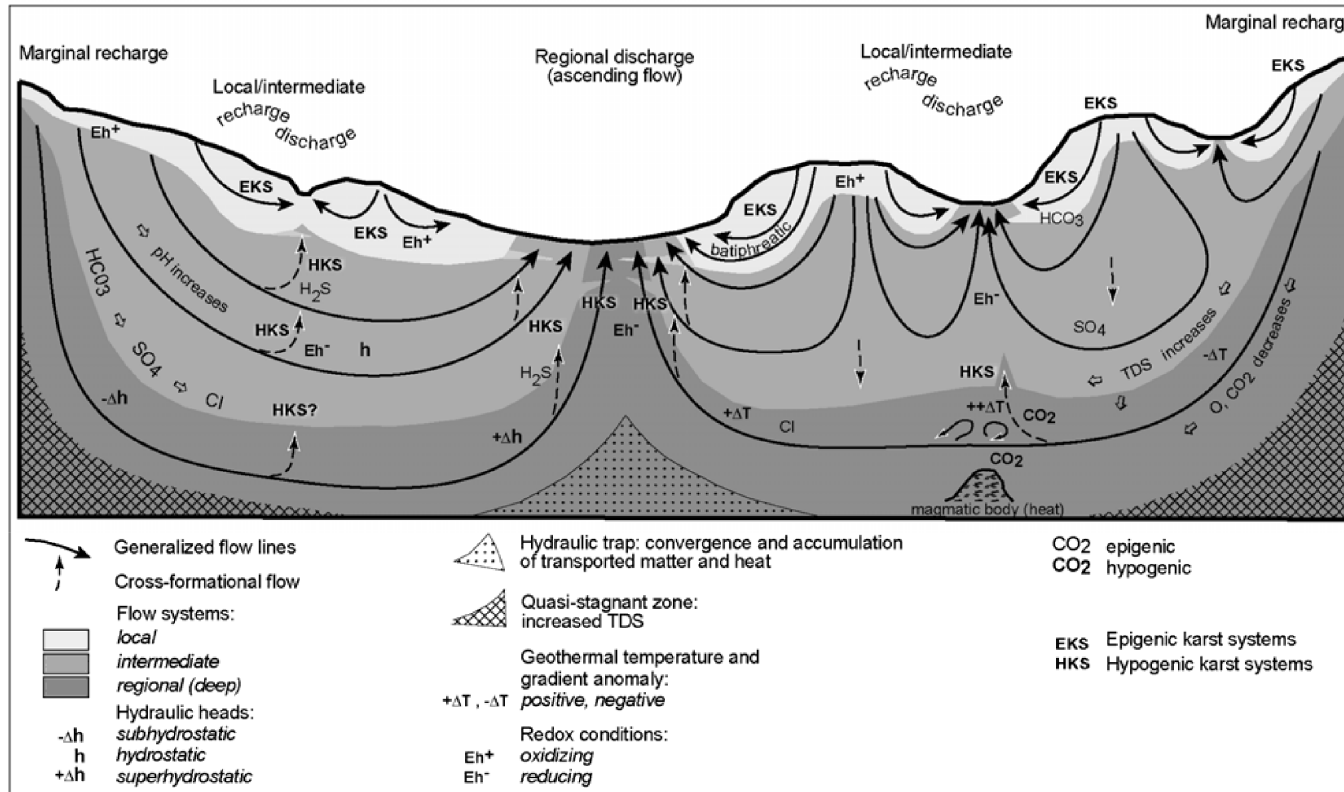


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From Reference 2.5.1-292.

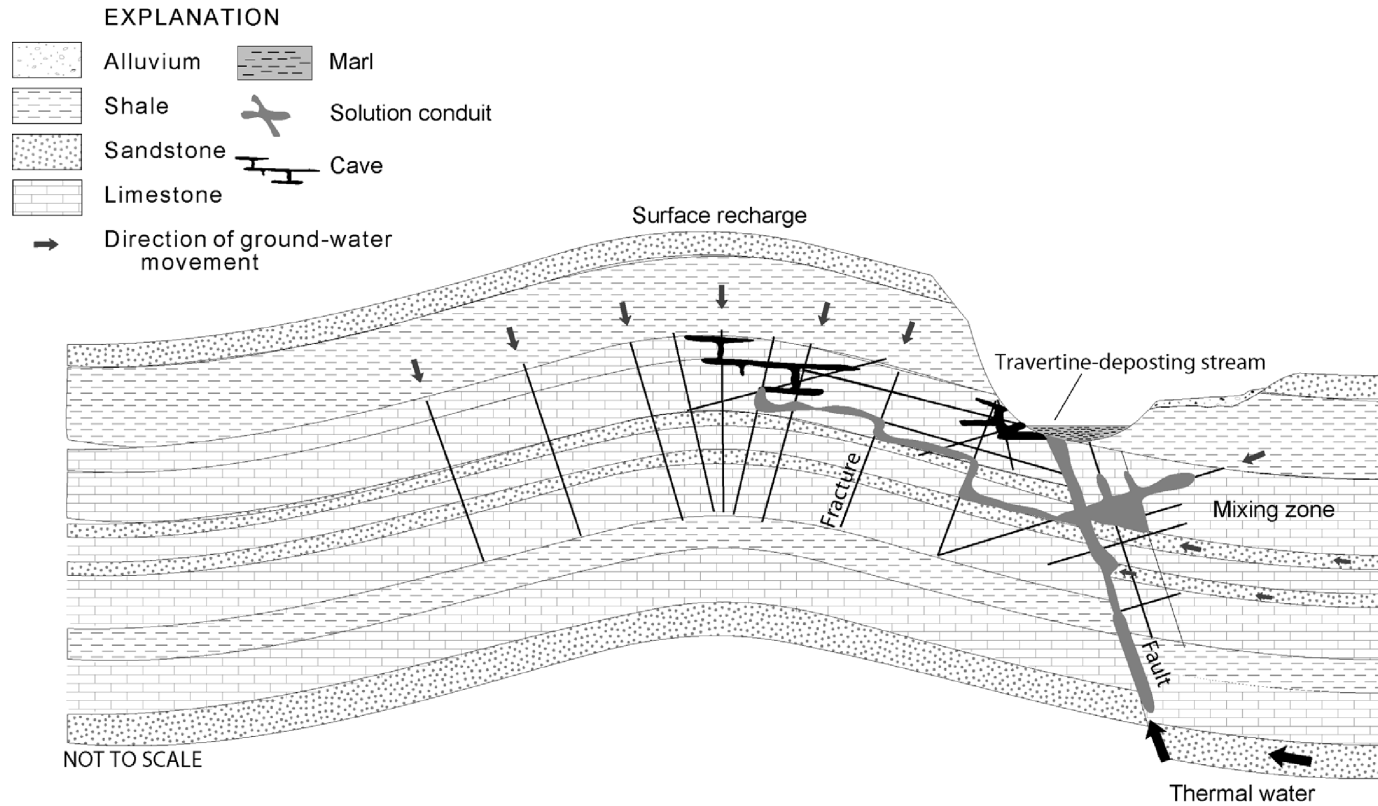
Figure 2.5.1-69. Karst Hydrogeologic Model for the Valley and Ridge Region, Tennessee



Epigenetic and hypogenic karst in the context of basinal groundwater flow. The figure shows mainly gravity-driven flow in an idealized homogenous basin. In reality, most sedimentary sequences are highly heterogeneous, and gravity-driven flow interacts with other flow mechanisms. From [Reference 2.5.1-289](#).

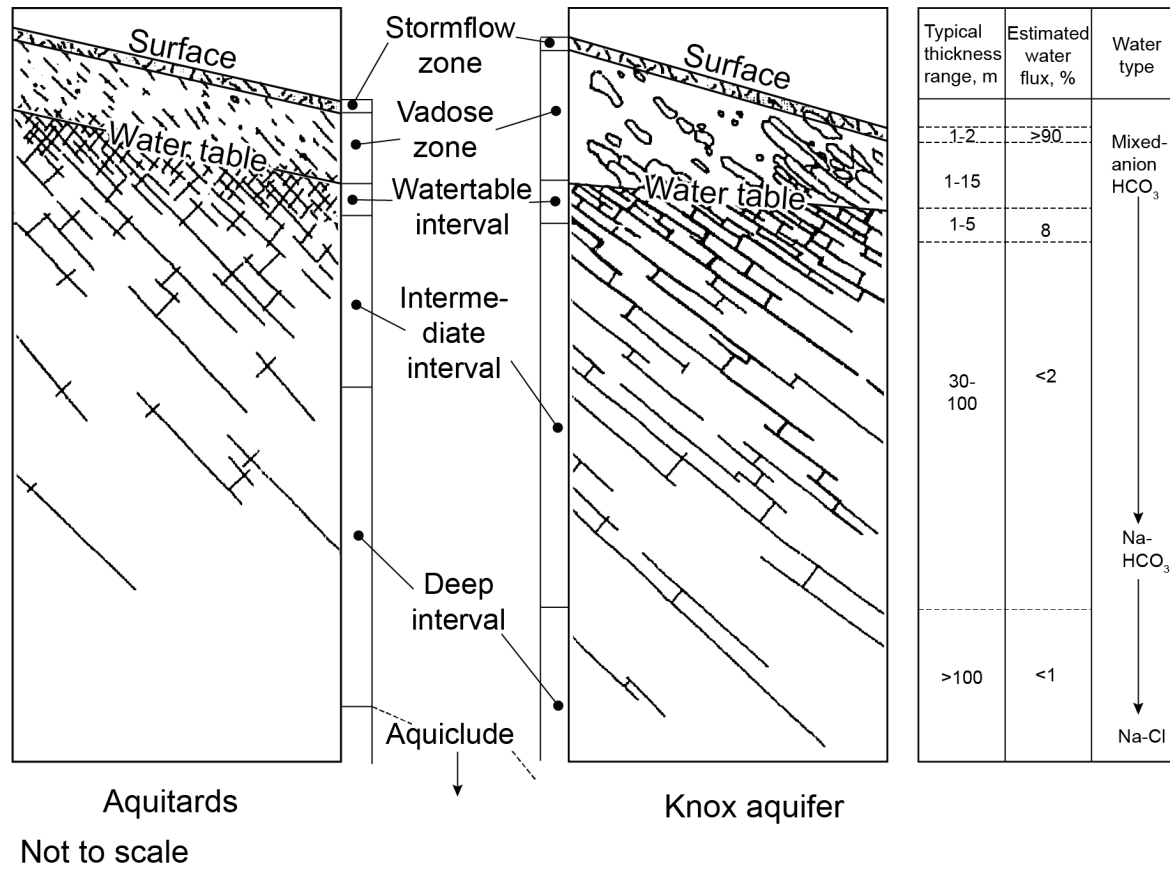
**Figure 2.5.1-70. Epigenetic and Hypogenic Karst in Basinal Groundwater Flow**





Schematic illustration of isolated phreatic maze cave development within a mixing zone localized near to a fault. Rising water along the fault intersects the shallow karst aquifer, and creates cavernous porosity in the mixing zone. If rising fluids were initially hydrothermal, alteration of the bedrock along fractures may result in slightly more resistance to weathering, and result in a cave located within a hill on the land surface. From [Reference 2.5.1-296](#).

**Figure 2.5.1-71. Isolated Phreatic Maze Cave Development in an Anticline Near a Fault**



Schematic vertical relationships of flow zones of the ORR, estimated thicknesses, water flow, and water types. From Hatcher et al. (Reference 2.5.1-9), Chapter 7

**Figure 2.5.1-72. Schematic Vertical Relationships of Groundwater Flow Zones in the ORR**



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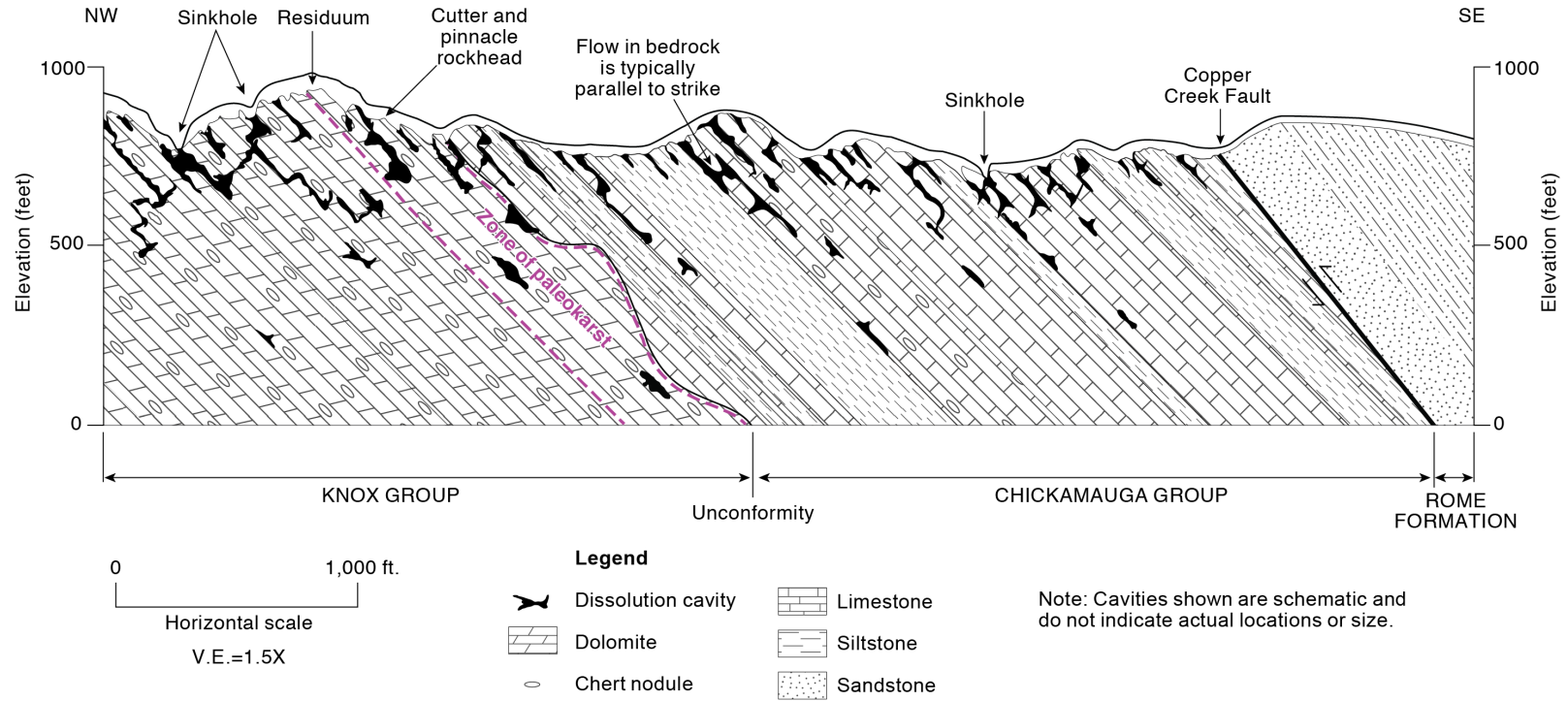
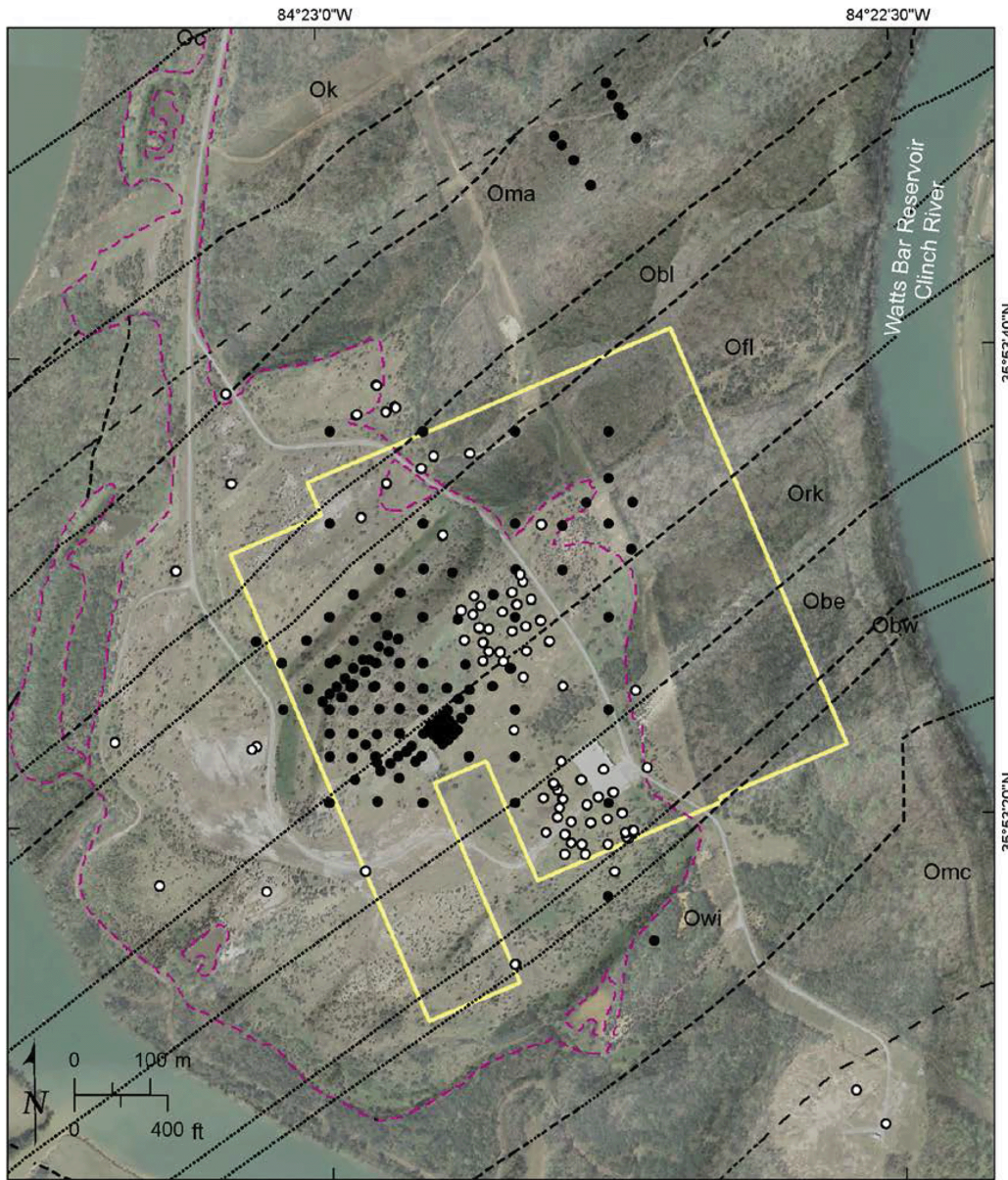


Figure 2.5.1-73. Karst Model of the CRN Site

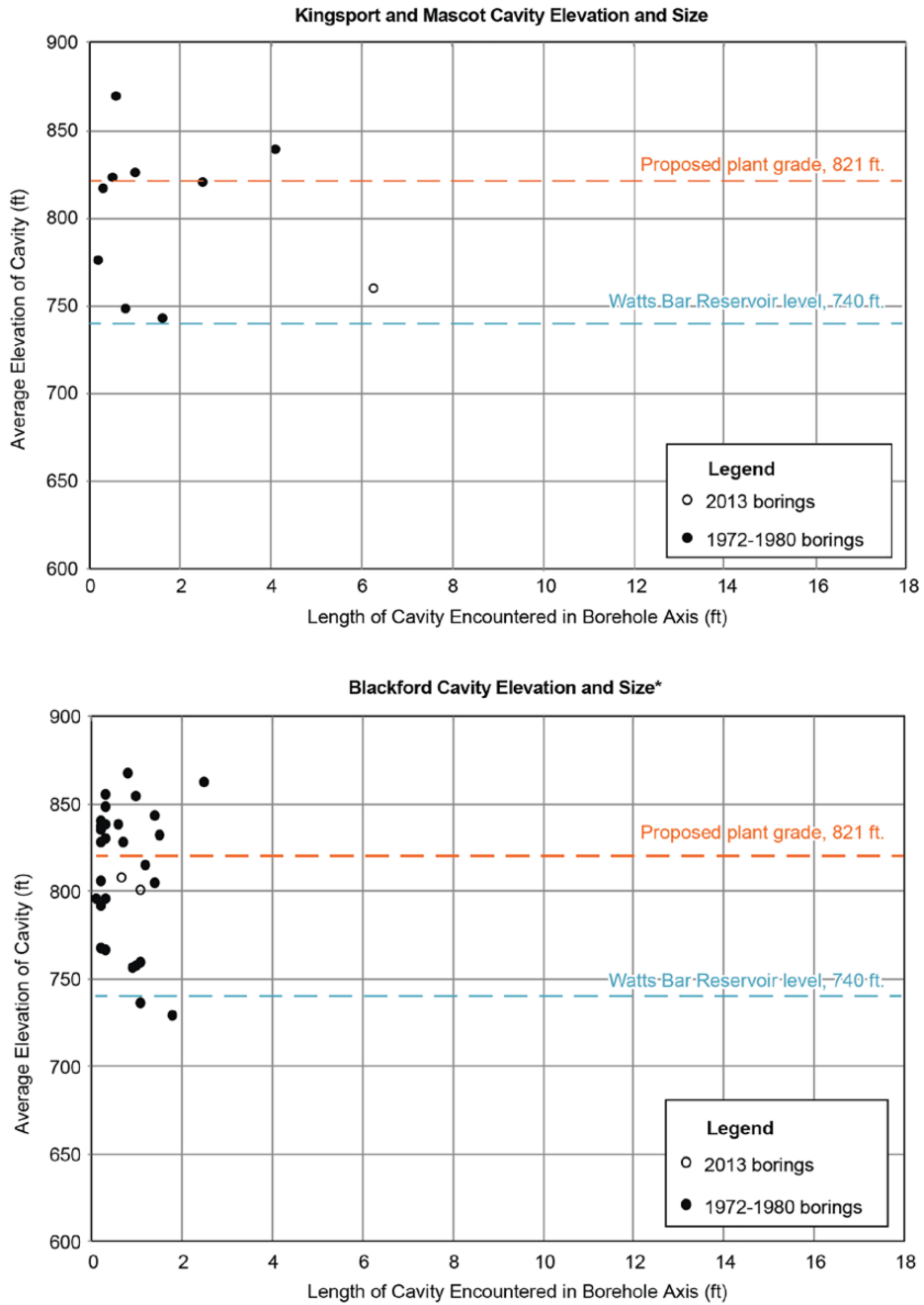
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- |                                                                                                                 |                                                                                                                                                                                                                                                                      |
|-----------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><i>Boreholes</i></p> <ul style="list-style-type: none"> <li>○ 2013 CRN</li> <li>● 1972-1980 CRBRP</li> </ul> | <ul style="list-style-type: none"> <li>⋯ Geologic contact, Ordovician strata; dashed where approximate, dotted where covered.</li> <li>- - - Fault</li> <li>□ Plant Parameter Envelope of the CRN site</li> <li>- - - Approximate boundary of graded area</li> </ul> |
|-----------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Note: See [Figure 2.5.1-79](#) for explanation of geologic units  
 1972–1980 CRBRP borehole data from [Reference 2.5.1-100](#)

**Figure 2.5.1-74. Borehole Plan for CRBRP and CRN Investigations**

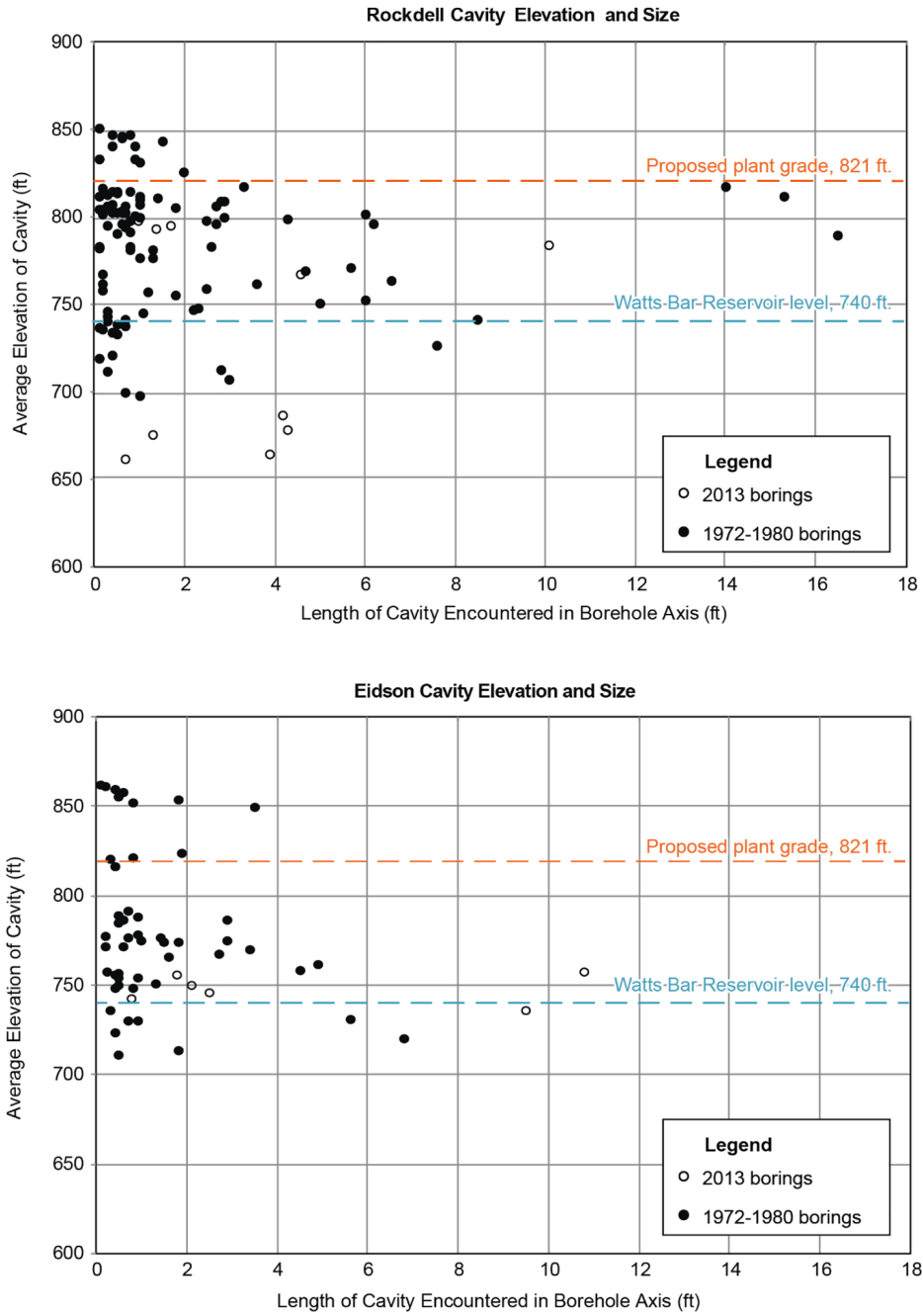


Note: Data from [References 2.5.1-100](#) and [2.5.1-214](#)  
 \*Does not include the Eidson member.

**Figure 2.5.1-75. Cavity Size and Elevation: Kingsport, Mascot, and Blackford Formations**

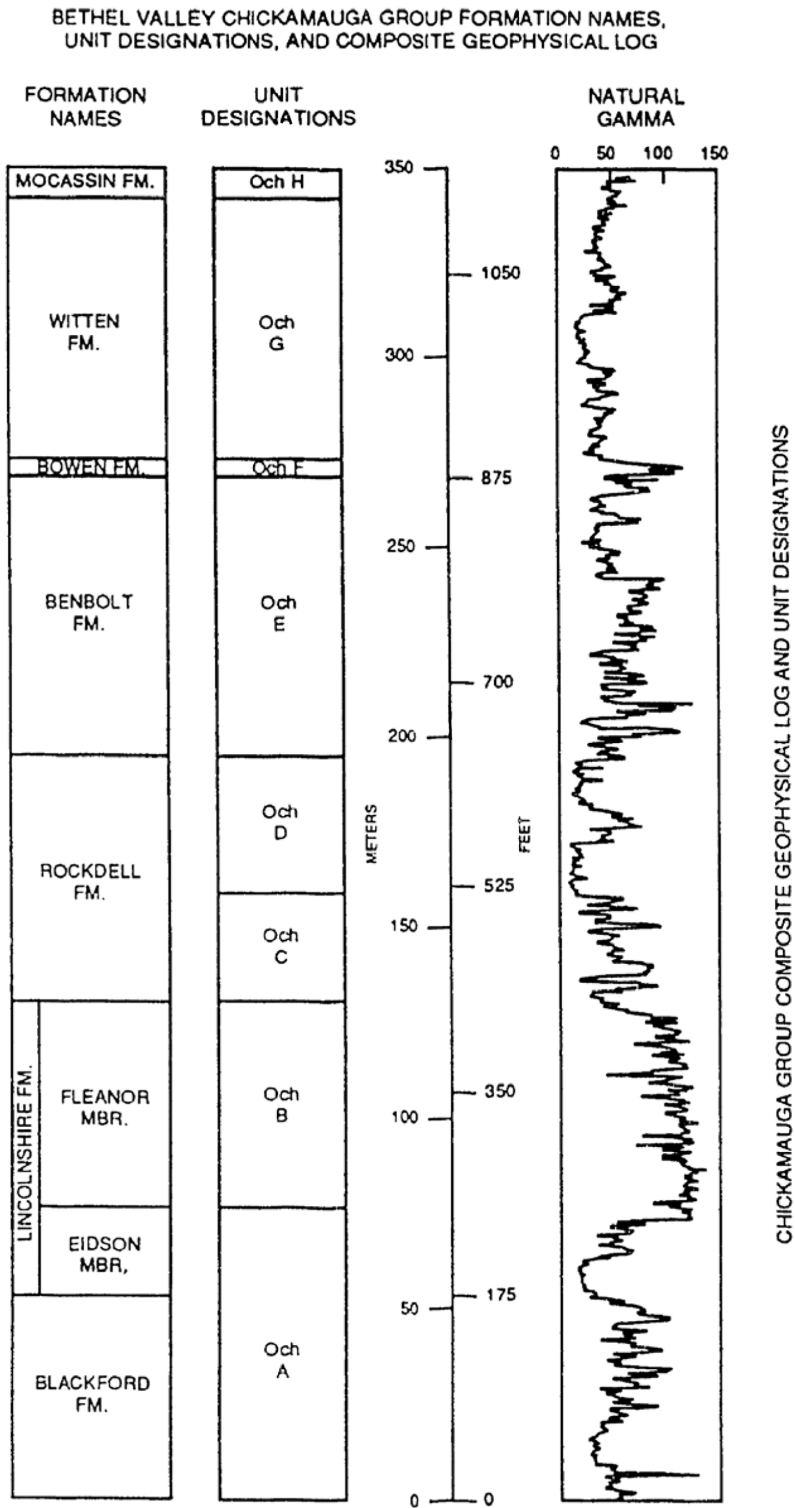






Note: Data from [References 2.5.1-100](#) and [2.5.1-214](#)

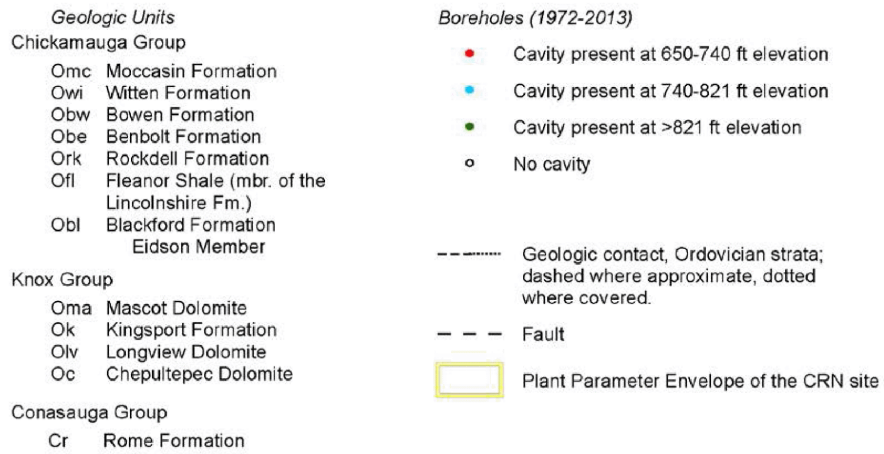
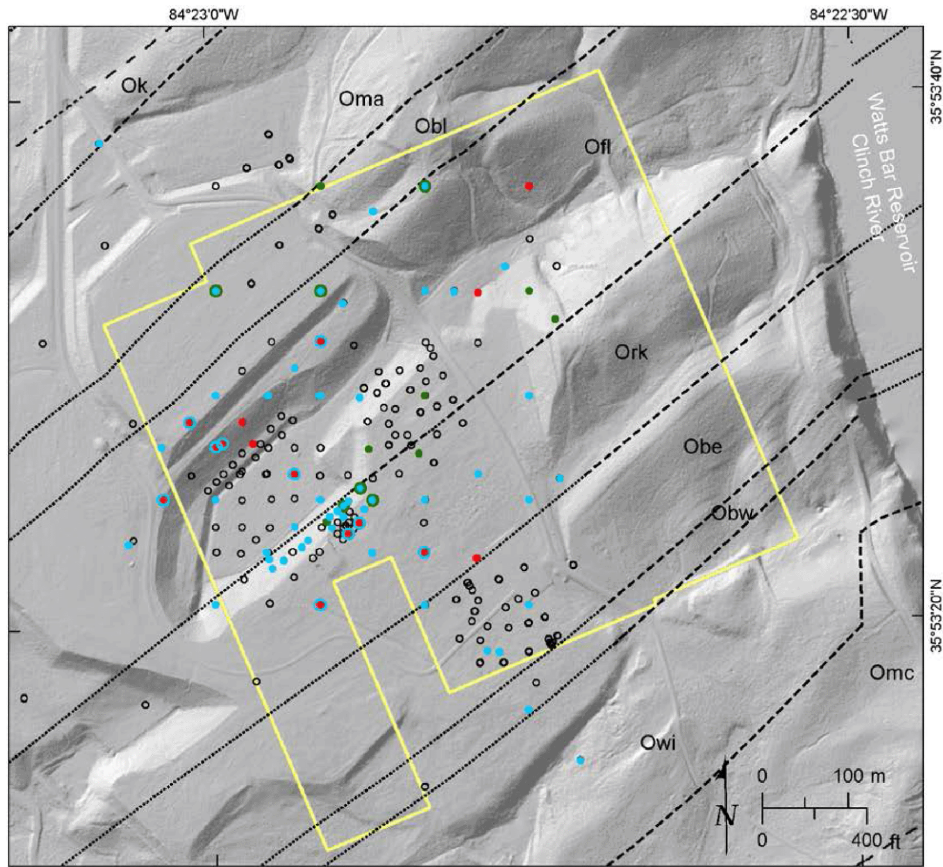
**Figure 2.5.1-77. Cavity Size and Elevation: Rockdell Formation and Eidson Member**



Note: From Reference 2.5.1-9

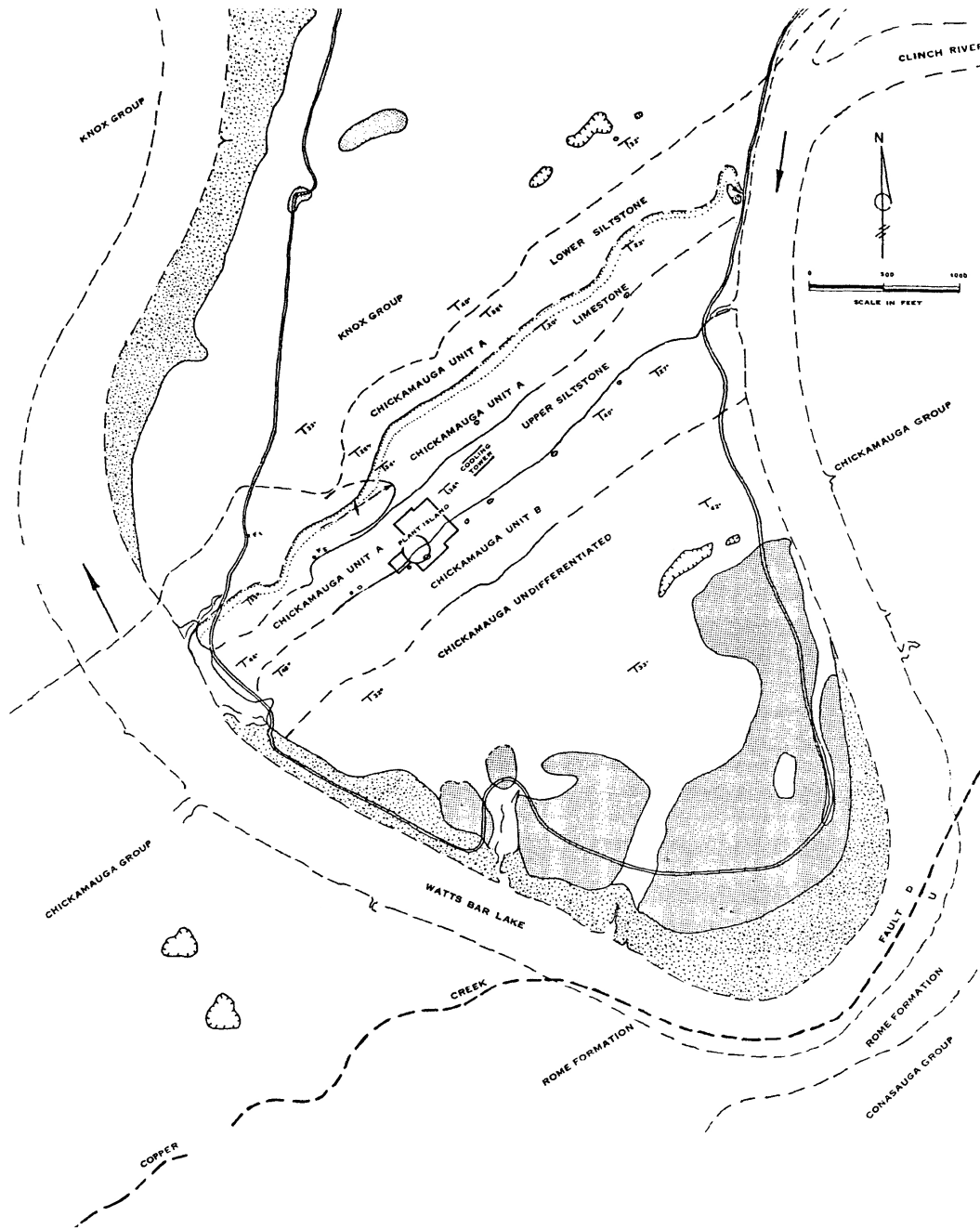
**Figure 2.5.1-78. Chickamauga Group Stratigraphic Column**

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**Figure 2.5.1-79. Map Distribution of Cavities in Rock Core**

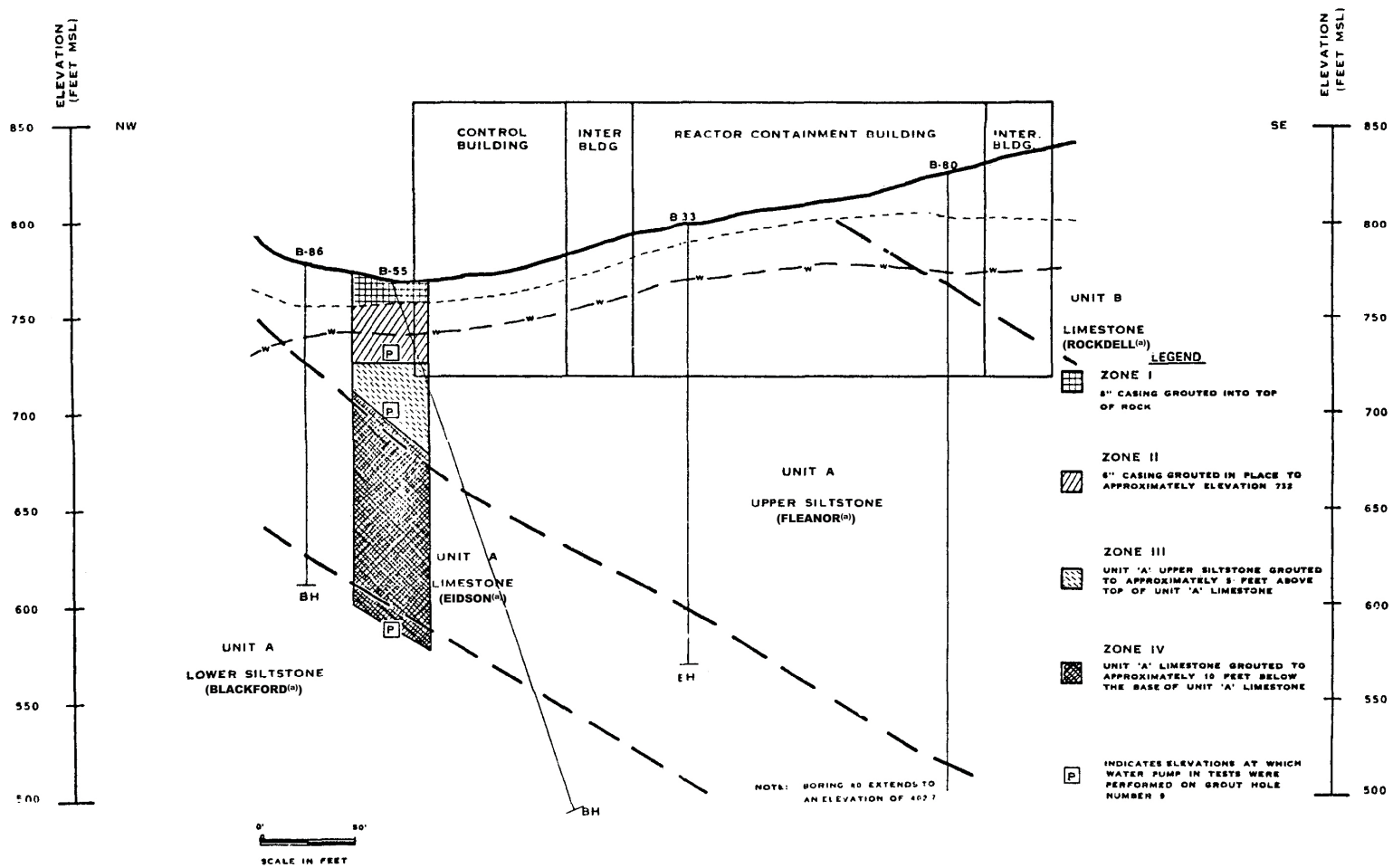




Reference 2.5.1-238

Figure 2.5.1-80. CRBRP Site Geologic Map

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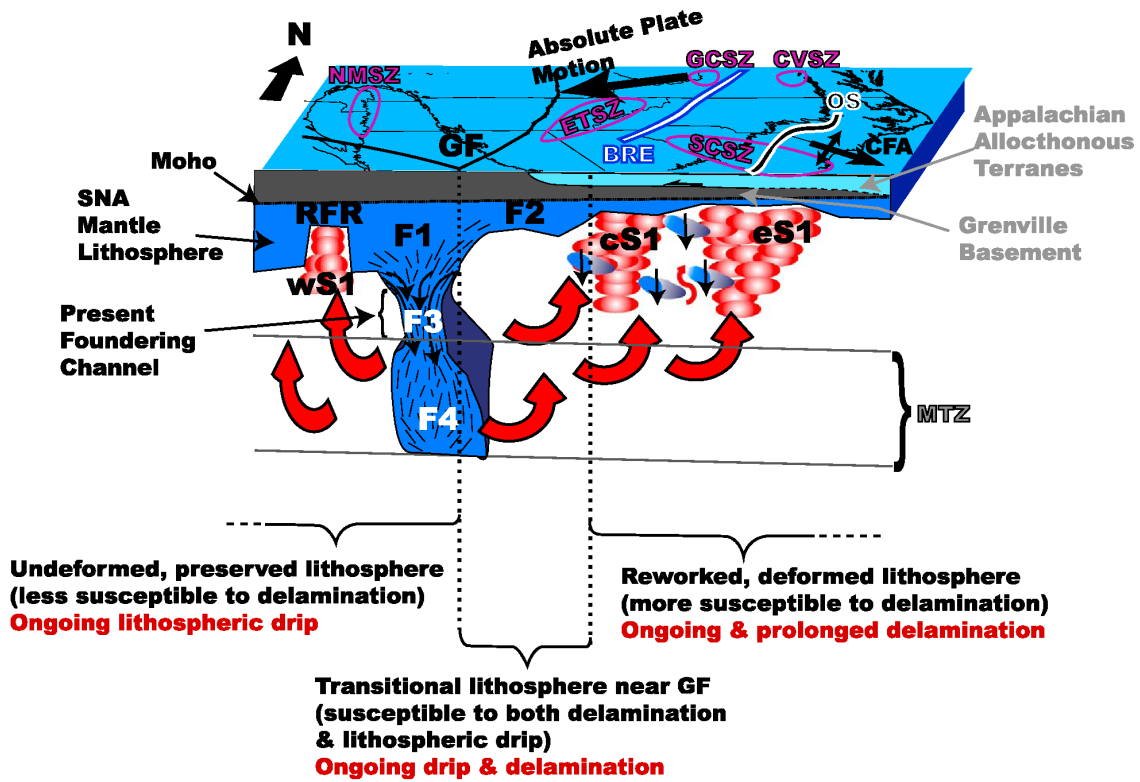


From Reference 2.5.1-238

Note:

(a) Description added to facilitate comparison with Figure 2.5.1-30

**Figure 2.5.1-81. CRBRP Site Geologic Cross Section**



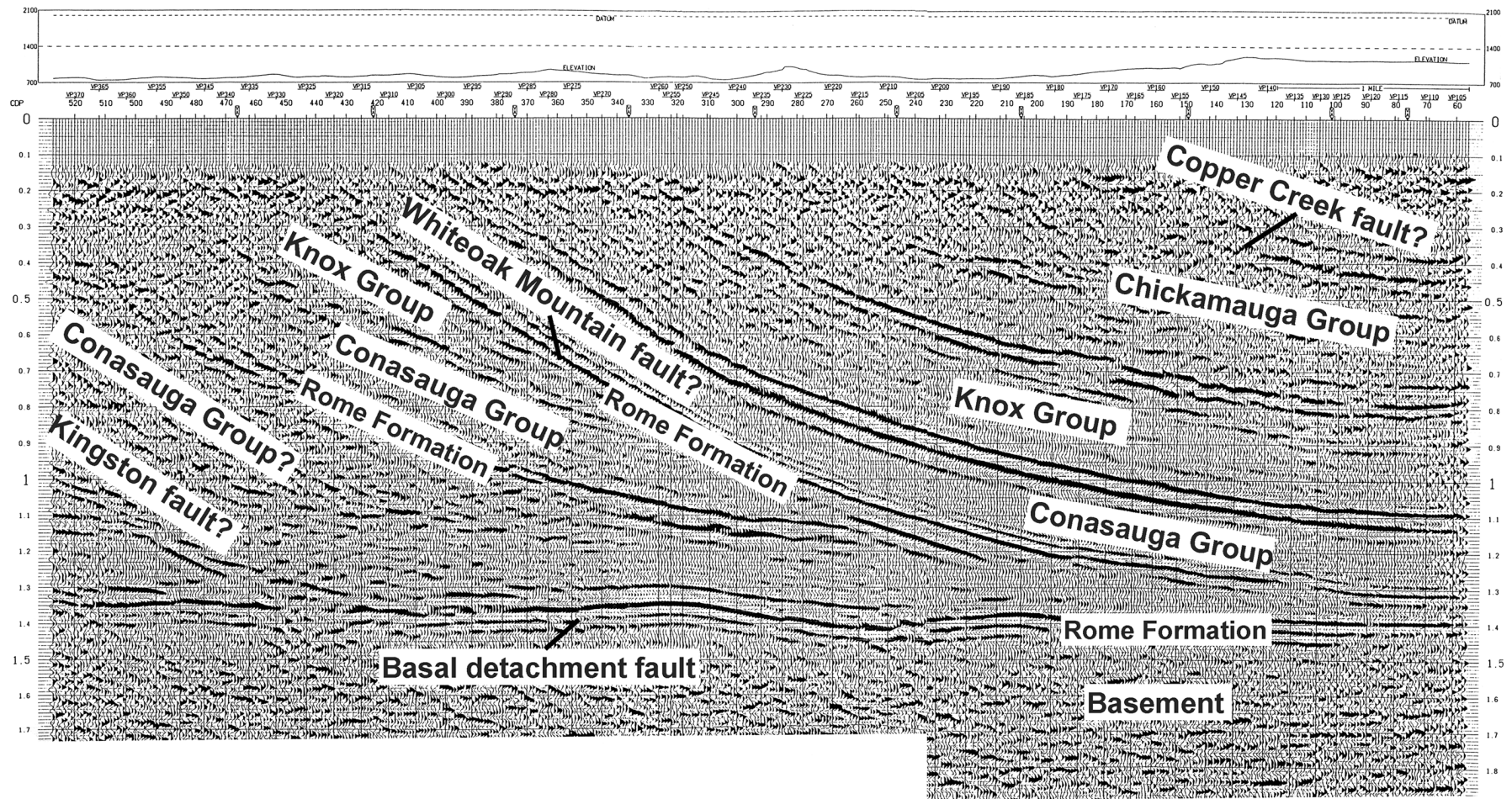
Notes:

BRE – Blue Ridge escarpment; CFA – Cape Fear arch; GF – Grenville front; OS – Orangeburg scarp; RFR – Reelfoot rift; CVSZ – Central Virginia seismic zone; ETSZ – East Tennessee seismic zone; GCSZ – Giles County seismic zone; SCSZ – South Carolina seismic zone; NMSZ – New Madrid seismic zone; SNA – Stable North America. F1, F2, F3, F4, cS1, eS1, and wS1 correspond to geophysical anomalies.

Source: Reference 2.5.1-313

Figure 2.5.1-82. Conceptual Model of Upper Mantle Structure Beneath the Southeastern U.S.

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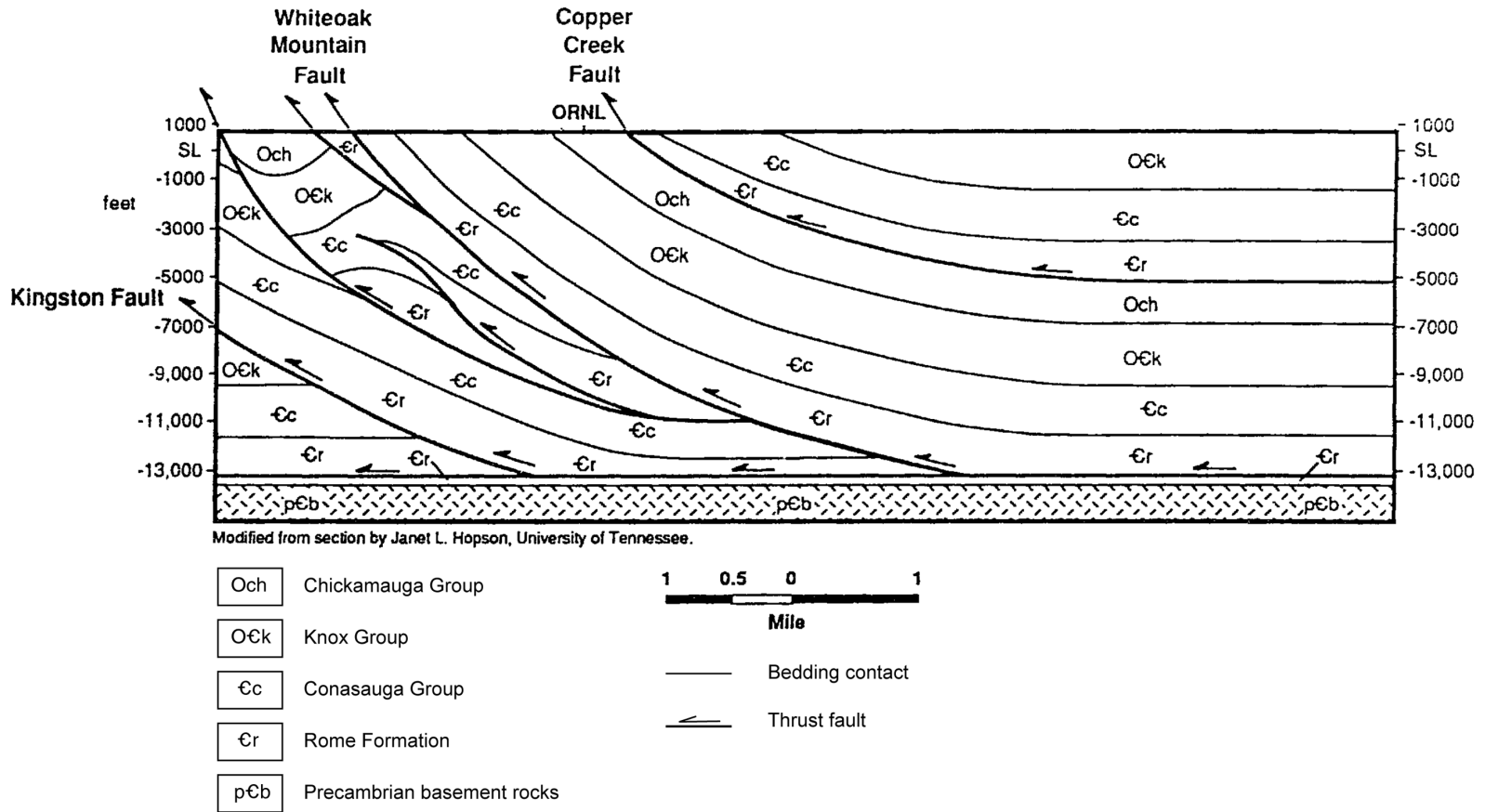


Note: Vertical axis is two-way travel time (seconds)

Figure 2.5.1-83. (Sheet 1 of 2) Interpreted Seismic Reflection Profile from Tennessee Highway 95

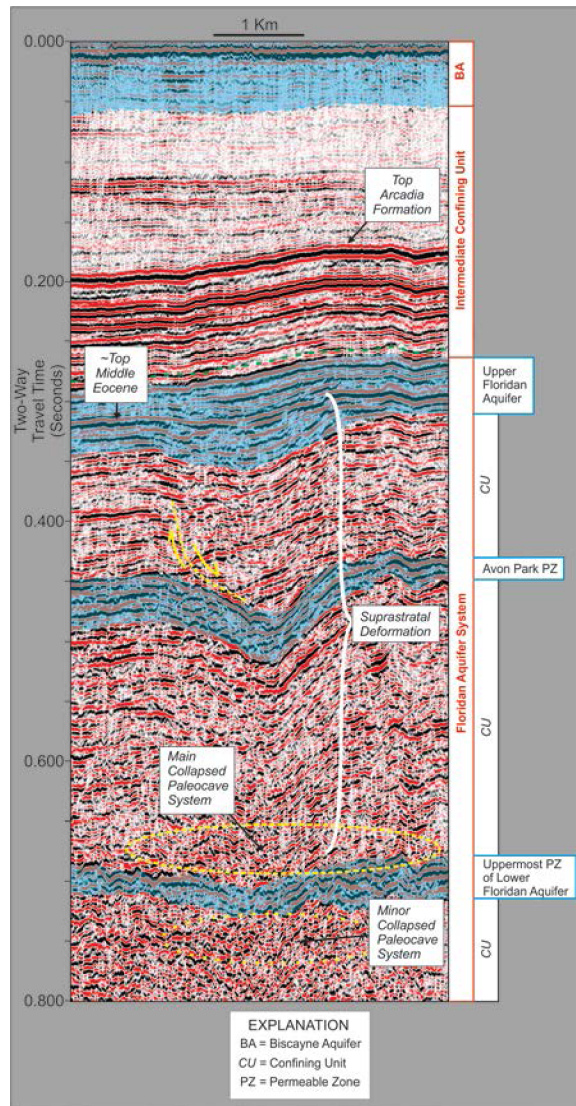


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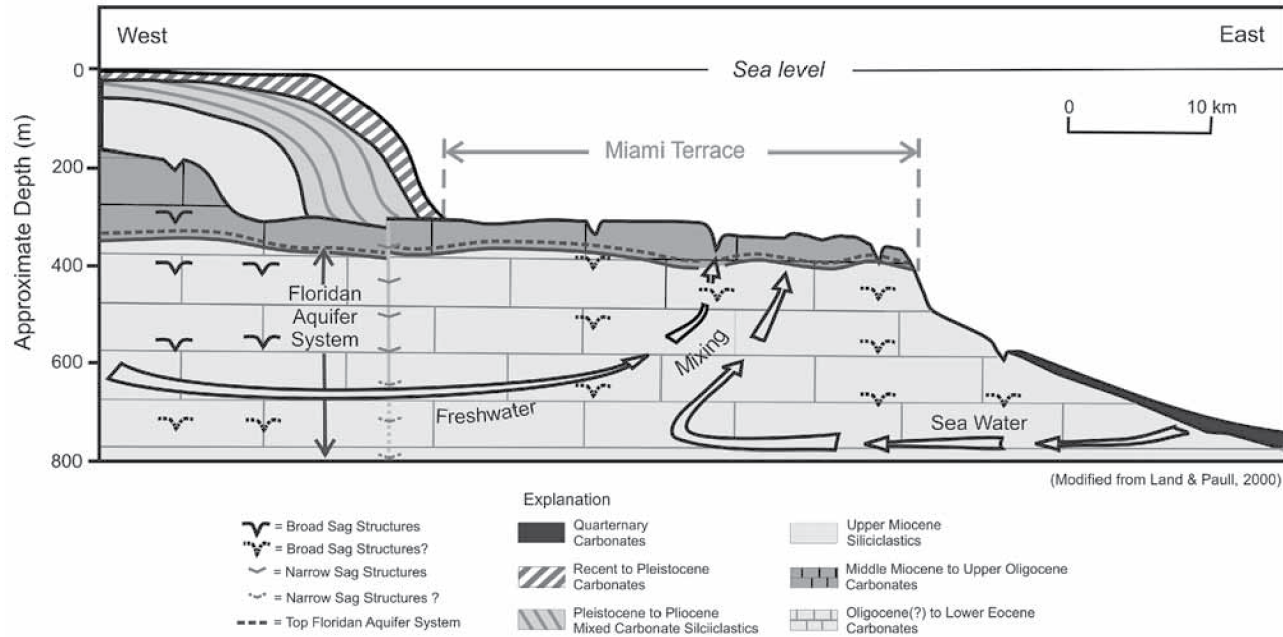
Source: Reference 2.5.1-9

**Figure 2.5.1-83. (Sheet 2 of 2) Geologic Cross Section Based on Seismic Reflection Profile from Tennessee Highway 95**



Source: Reference 2.5.1-318

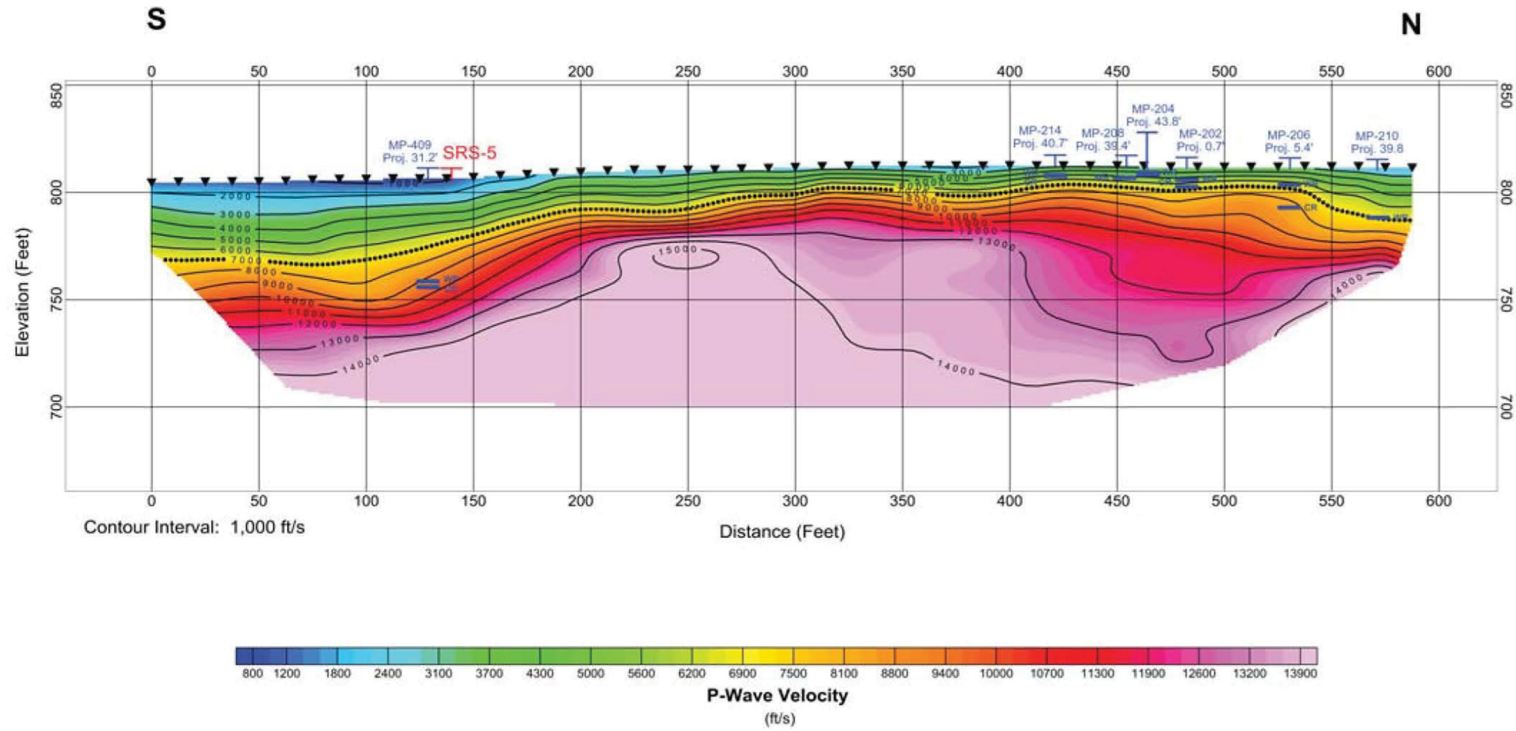
**Figure 2.5.1-84. Seismic Reflection Profile from Biscayne Bay, Florida, Showing Large Scale Sag Features Attributed to Hypogene Dissolution**



Source: Reference 2.5.1-41

**Figure 2.5.1-85. Schematic Cross Section of Biscayne Bay Showing a Possible Model for Hypogene Dissolution**

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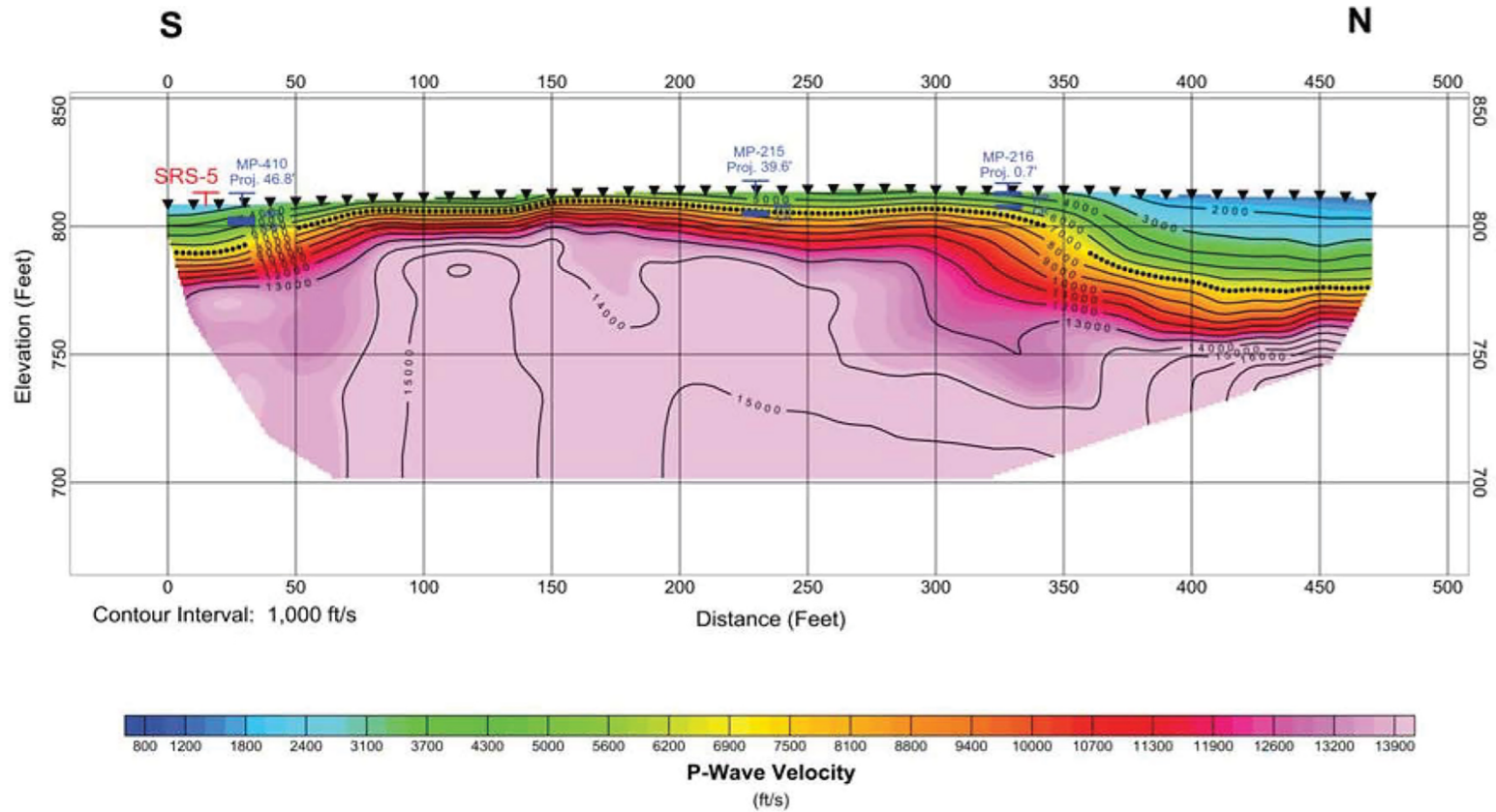


Source: Reference 2.5.1-214  
See explanation on Sheet 7.

Figure 2.5.1-86. (Sheet 1 of 7) Seismic Tomography Model SRS-1



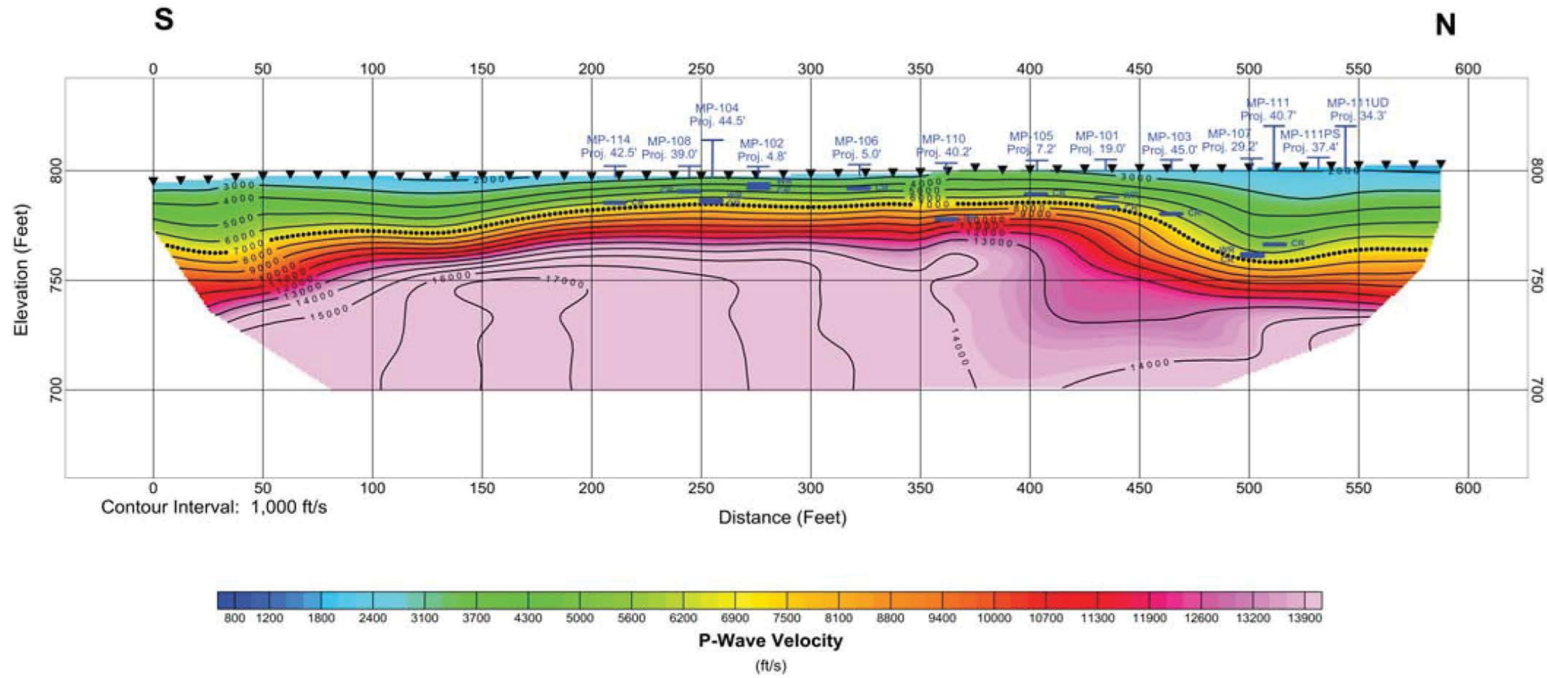
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Source: Reference 2.5.1-214  
See explanation on Sheet 7.

Figure 2.5.1-86. (Sheet 2 of 7) Seismic Tomography Model SRS-2

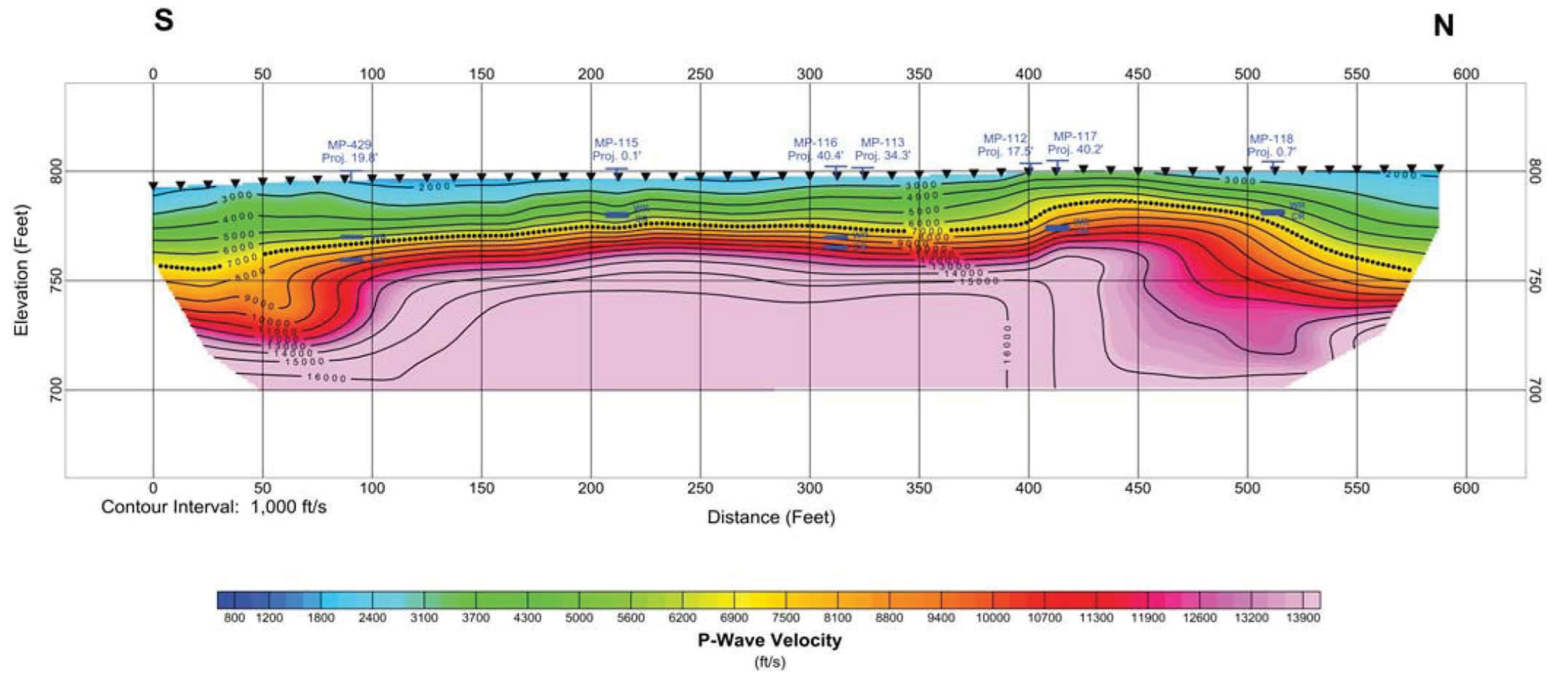
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Source: Reference 2.5.1-214  
See explanation on Sheet 7.

Figure 2.5.1-86. (Sheet 3 of 7) Seismic Tomography Model SRS-3

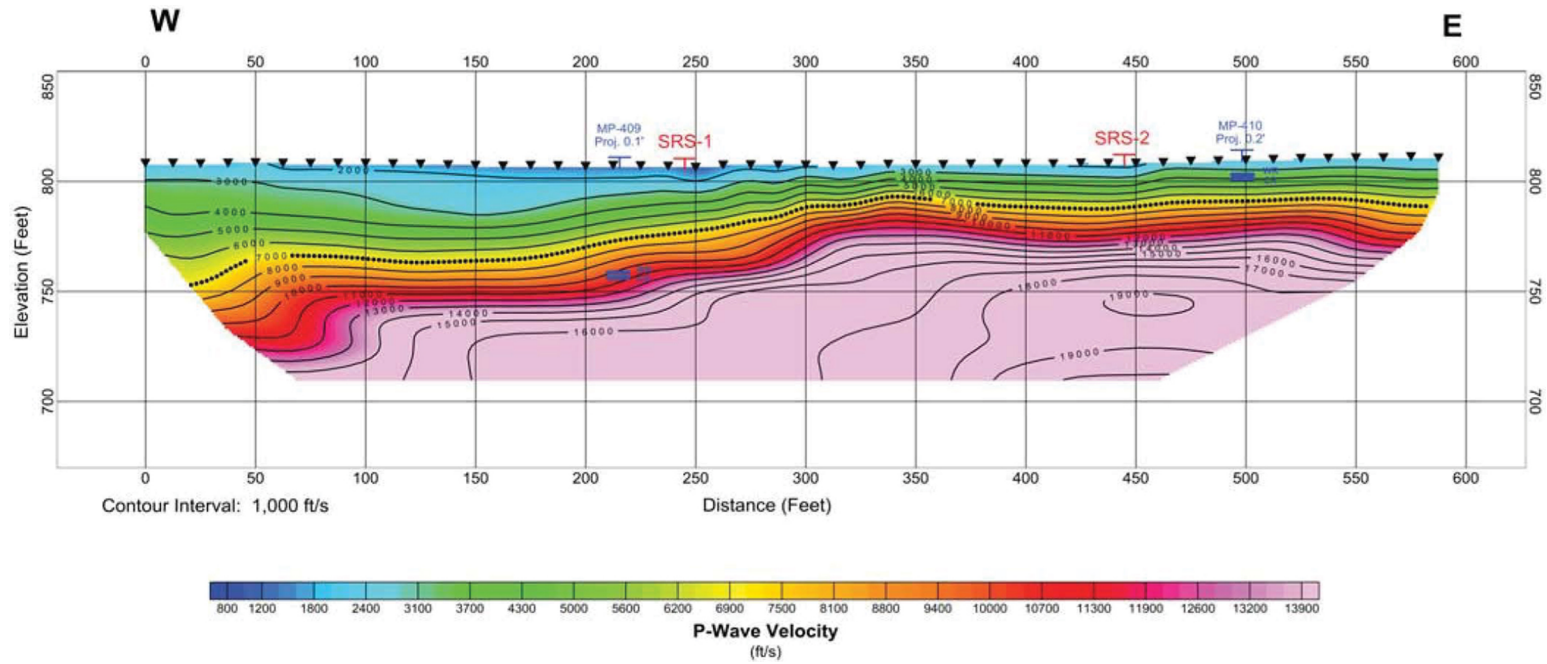
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Source: Reference 2.5.1-214  
See explanation on Sheet 7.

Figure 2.5.1-86. (Sheet 4 of 7) Seismic Tomography Model SRS-4

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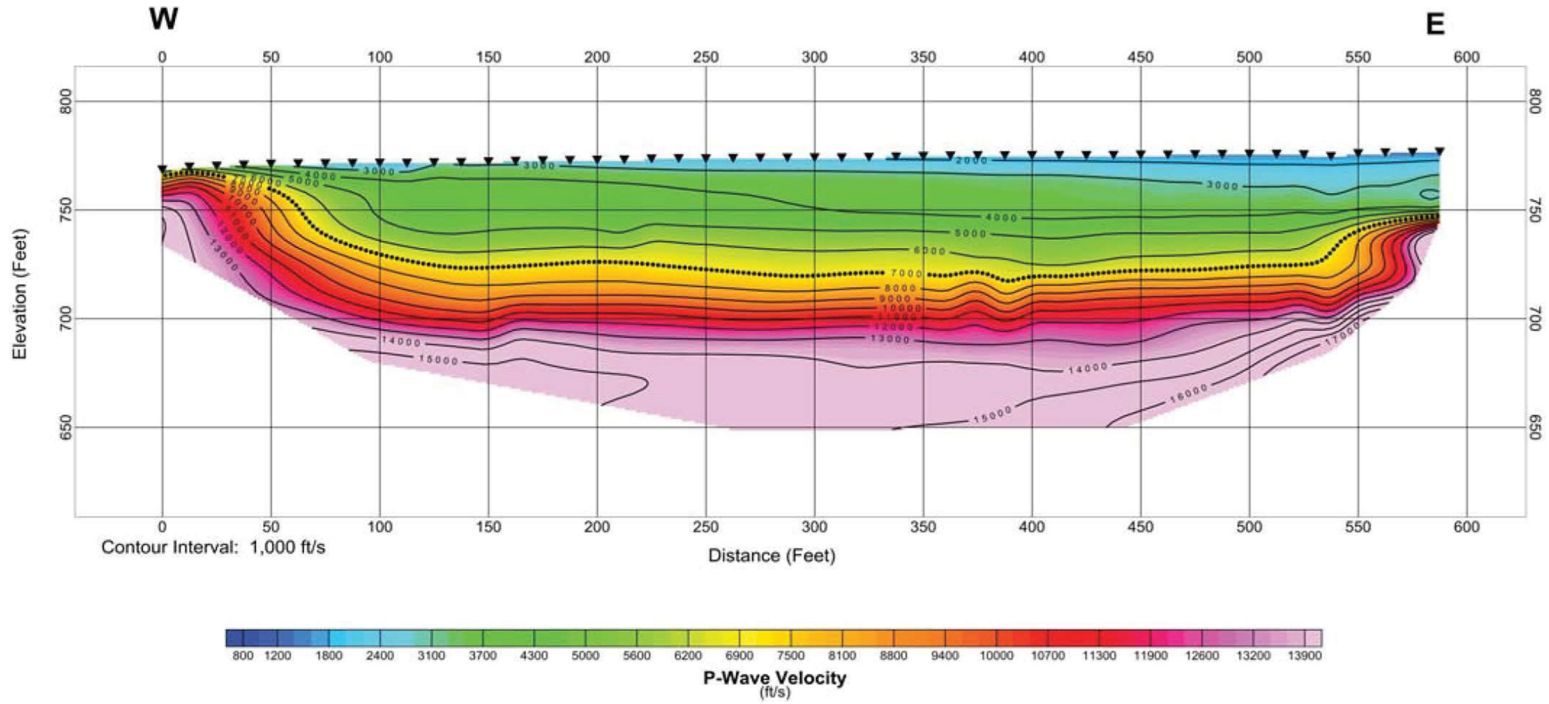


Source: Reference 2.5.1-214  
See explanation on Sheet 7.

Figure 2.5.1-86. (Sheet 5 of 7) Seismic Tomography Model SRS-5







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Source: Reference 2.5.1-214  
See explanation on Sheet 7.

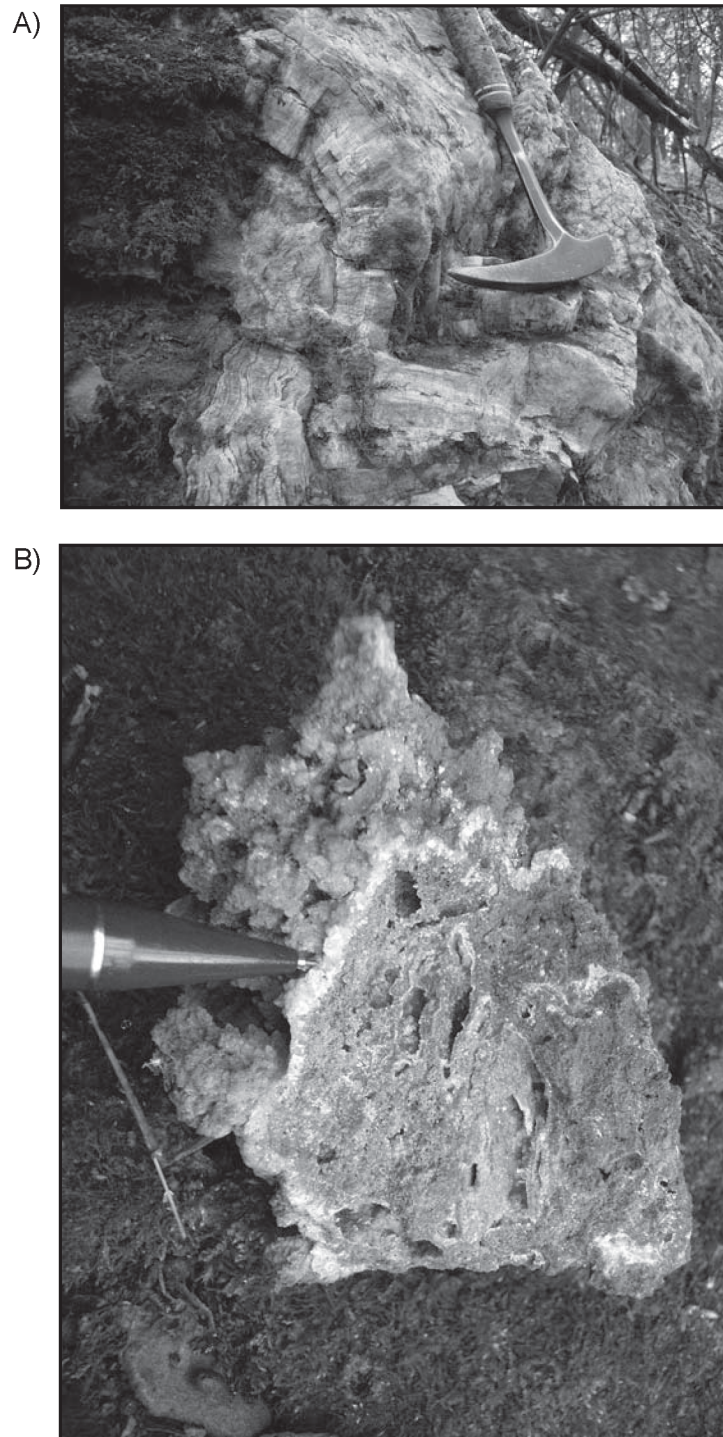
Figure 2.5.1-86. (Sheet 6 of 7) Seismic Tomography Model SRS-6

## Explanation

- ▼ Geophone Location
-  SRS-5 Line Intersection
-  MP-409  
Proj. 31.2' Borehole Intersection
-  WR  
CR Weathered Rock and Competent Rock Interpretations  
from AMEC E&I Borehole Logs
-  ..... Interpreted Seismic Bedrock Interface

Source: Reference 2.5.1-214  
See Sheets 1-6.

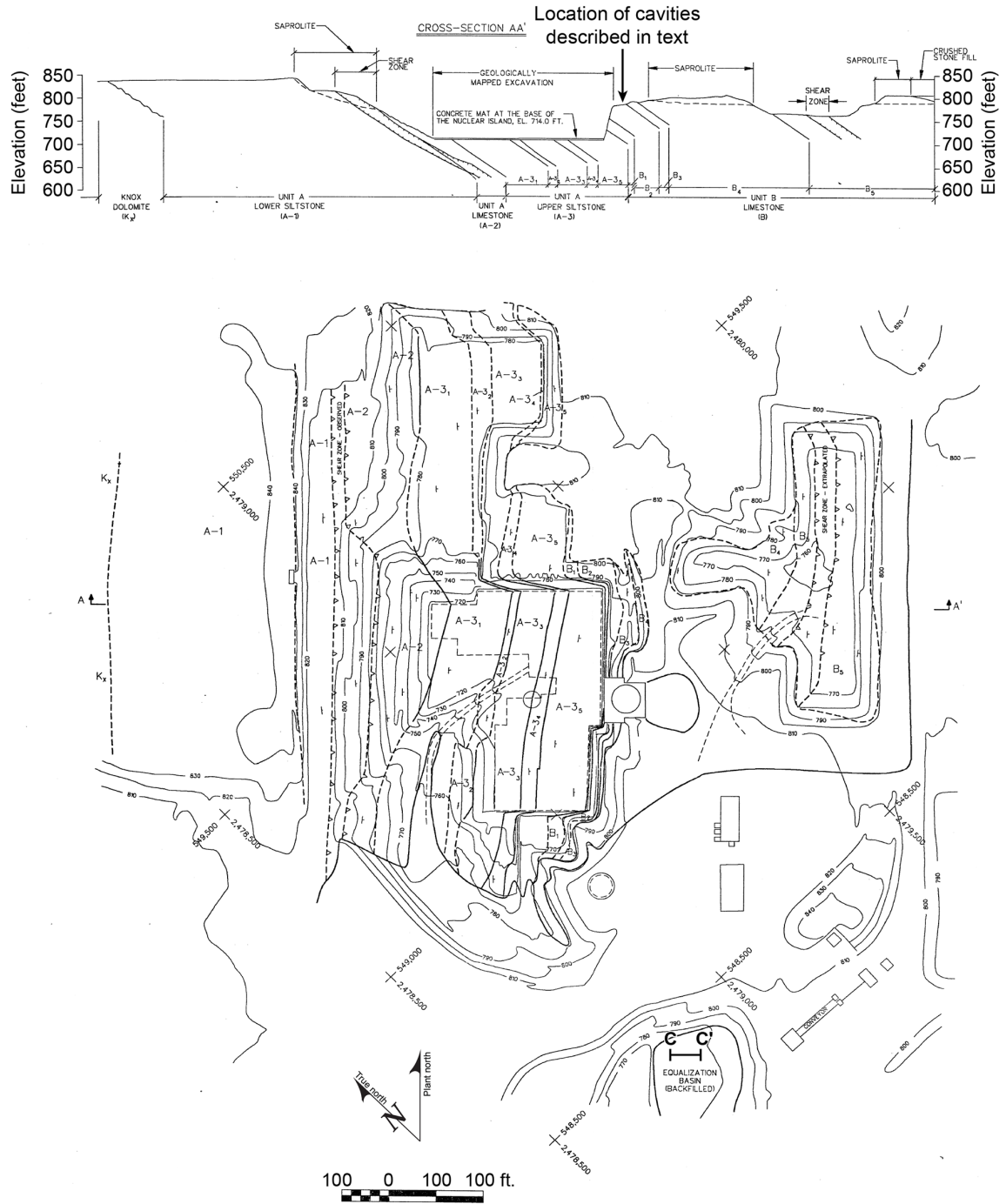
**Figure 2.5.1-86. (Sheet 7 of 7) Explanation for Seismic Tomography Models**



Source: [Reference 2.5.1-319](#)

**Figure 2.5.1-87. Crystalline Calcite Deposits Indicating a Hypogene Origin in Caves of Shenandoah Valley, Virginia**

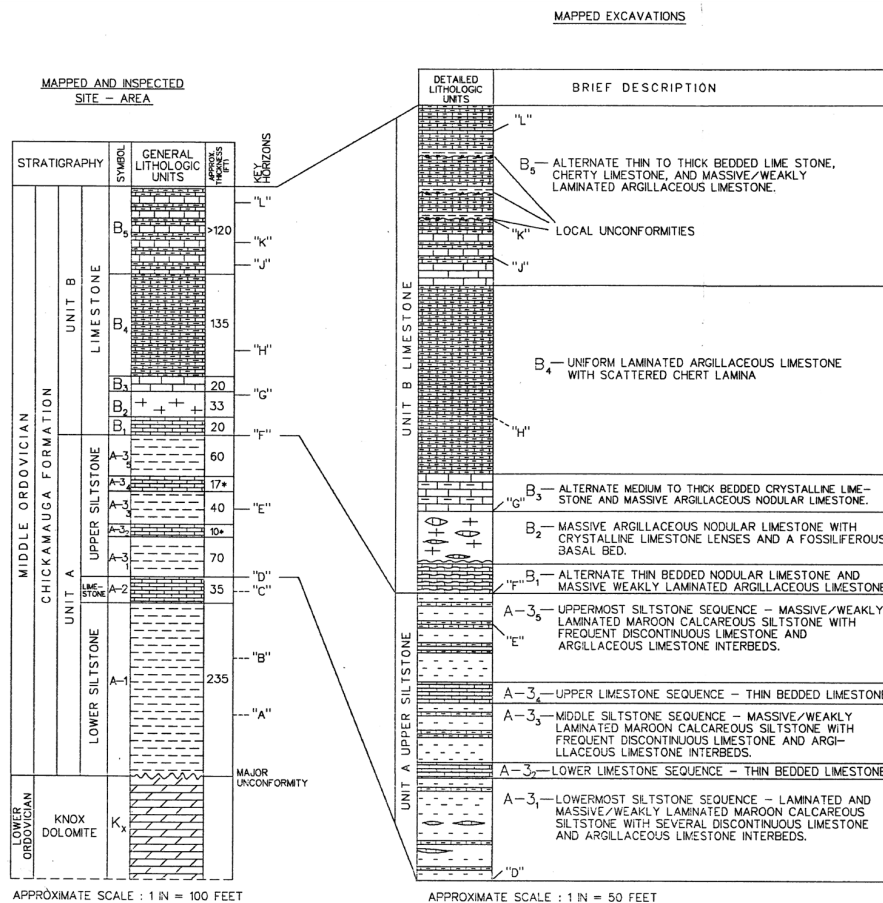
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Source: Reference 2.5.1-303

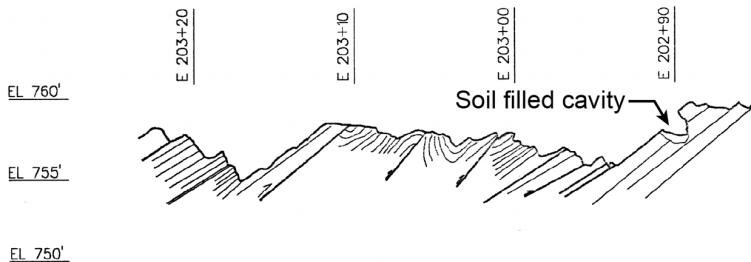
**Figure 2.5.1-88. (Sheet 1 of 2) Geologic Map of the 1983 CRBRP Excavations**

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NOTE : LITHOLOGIC SYMBOLS IN THE SITE-AREA COLUMN ARE SIMPLIFIED WITH RESPECT TO THOSE USED IN THE MORE DETAILED MAPPED EXCAVATIONS COLUMN TO PERMIT EASY IDENTIFICATION OF THE MAJOR UNITS.  
 • THICKNESS IN THE NUCLEAR ISLAND.

SECTION C-C @ N42+00



Source: Reference 2.5.1-303.

**Figure 2.5.1-88. (Sheet 2 of 2) Geologic Column and Cross Section of the 1983 CRBRP Excavations**

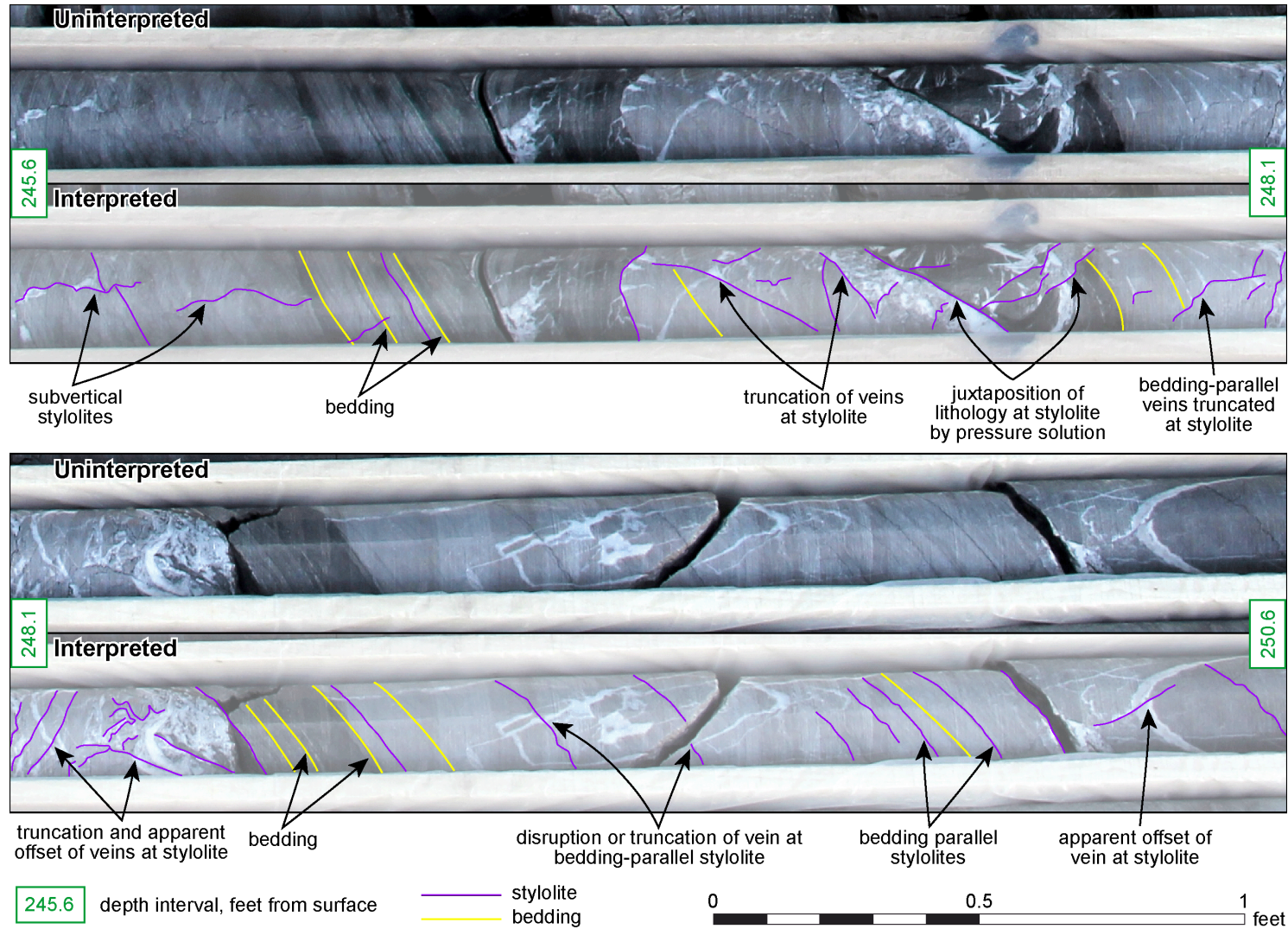




**PHOTOGRAPH 26**  
**SOLUTION CAVITIES ALONG BEDDING AND STRIKE-JOINTS ON THE BENCH (EL. 780 FT) ABOVE FACE IV (UPPER), AND KARSTIFIED LIMESTONE IN THE EQUALIZATION BASIN, WITH NUMEROUS CAVITIES**

Source: [Reference 2.5.1-303](#)

**Figure 2.5.1-89. Cavities in the Rockdell Formation Exposed in the 1983 CRBRP Excavations**

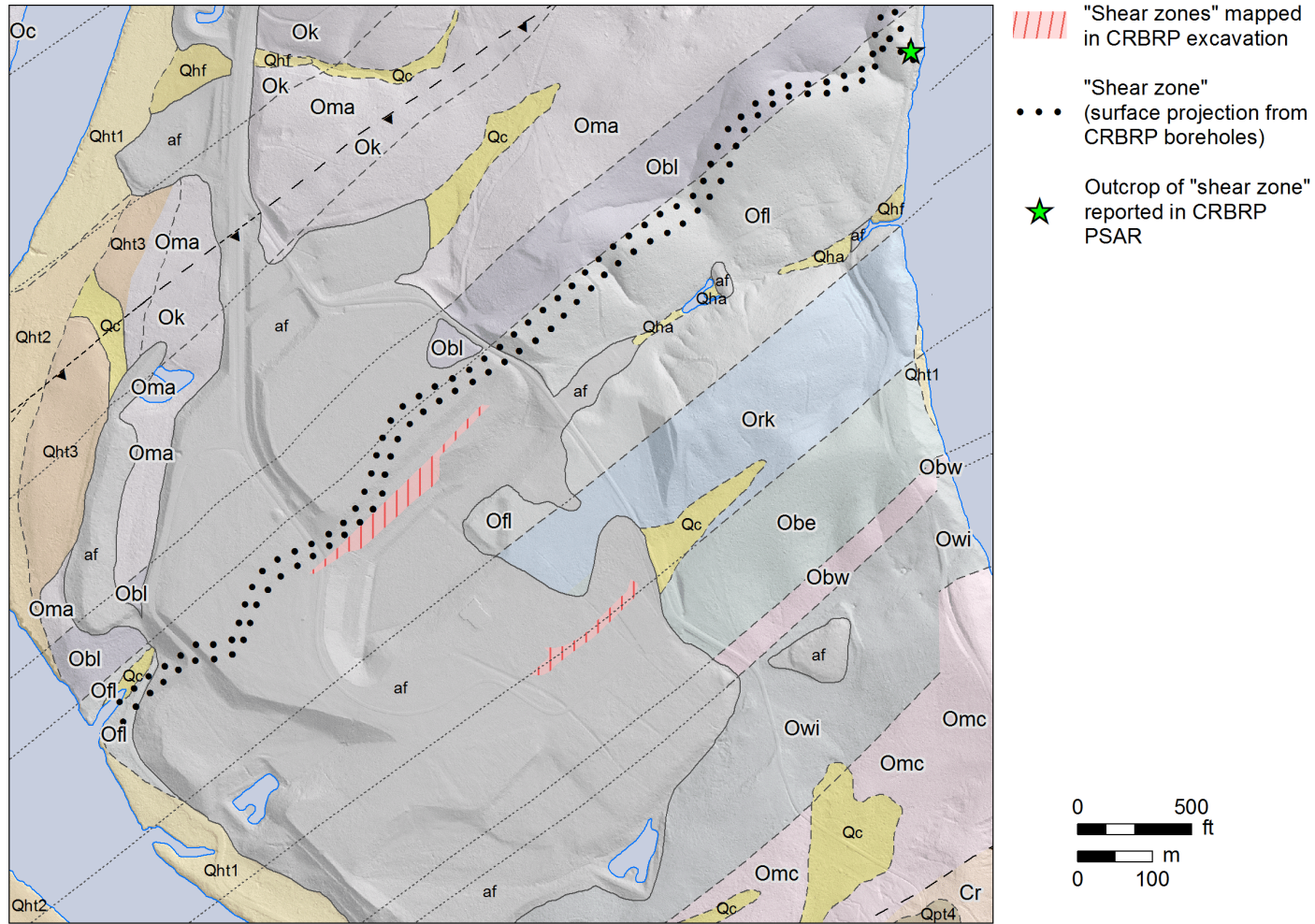


Note: Core photo from Reference 2.5.1-214

**Figure 2.5.1-90. Interpreted Core Photo of Borehole MP-101 Demonstrating Shear-Fracture Zone Attributes**



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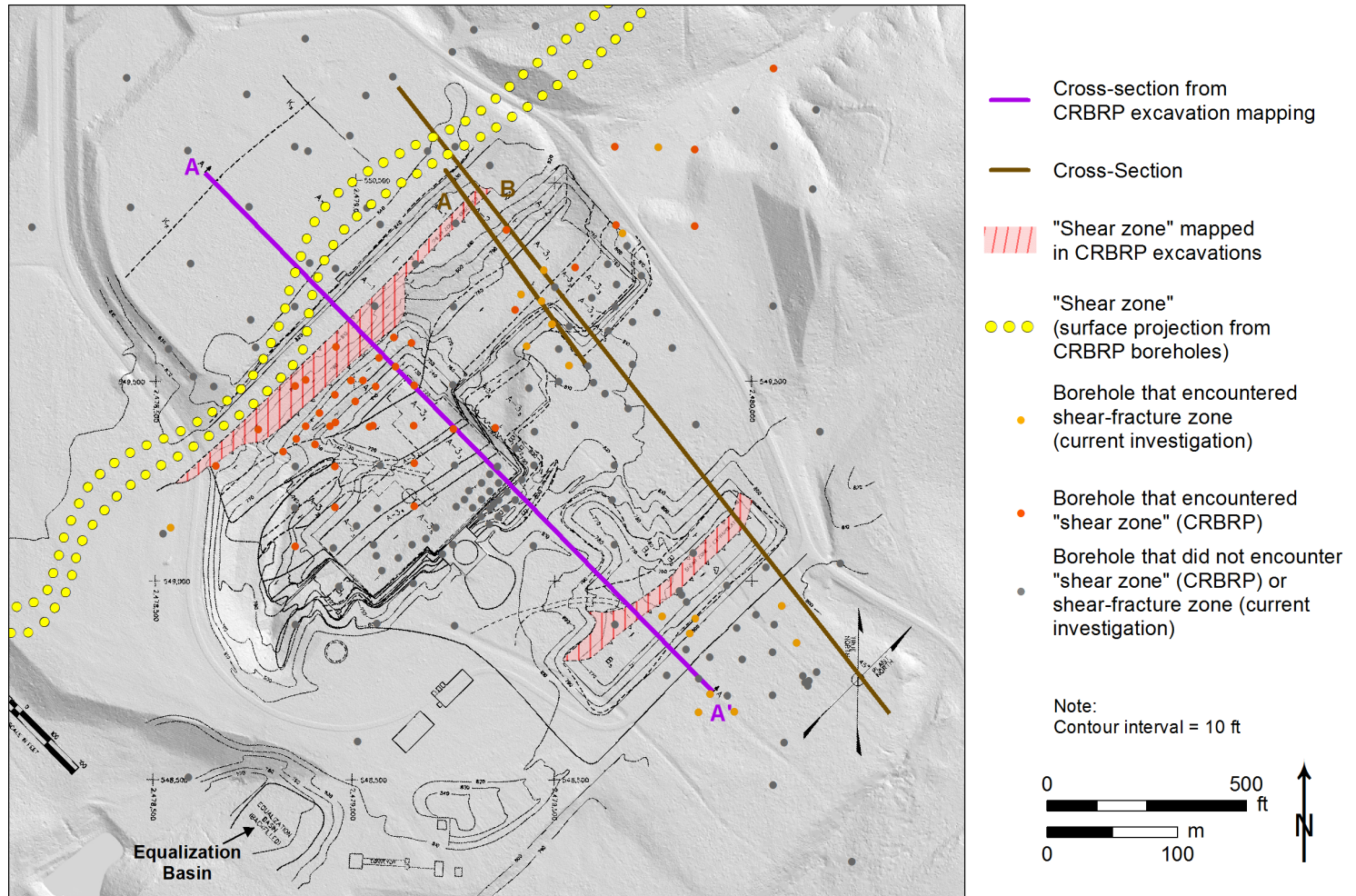


Note: Geologic unit symbols are defined in [Figure 2.5.1-29](#) (Sheet 2 of 2). The "shear zone" identified in the CRBRP PSAR is referred to as shear-fracture zone in the current investigation.

Sources: [References 2.5.1-303](#) (Plate 2, mapped "shear zone") and [Reference 2.5.1-238](#) (Illustration 7, surface projection of "shear zone" and outcrop location)

**Figure 2.5.1-91. (Sheet 1 of 3) Site Geologic Map Showing Mapped "Shear Zones"**

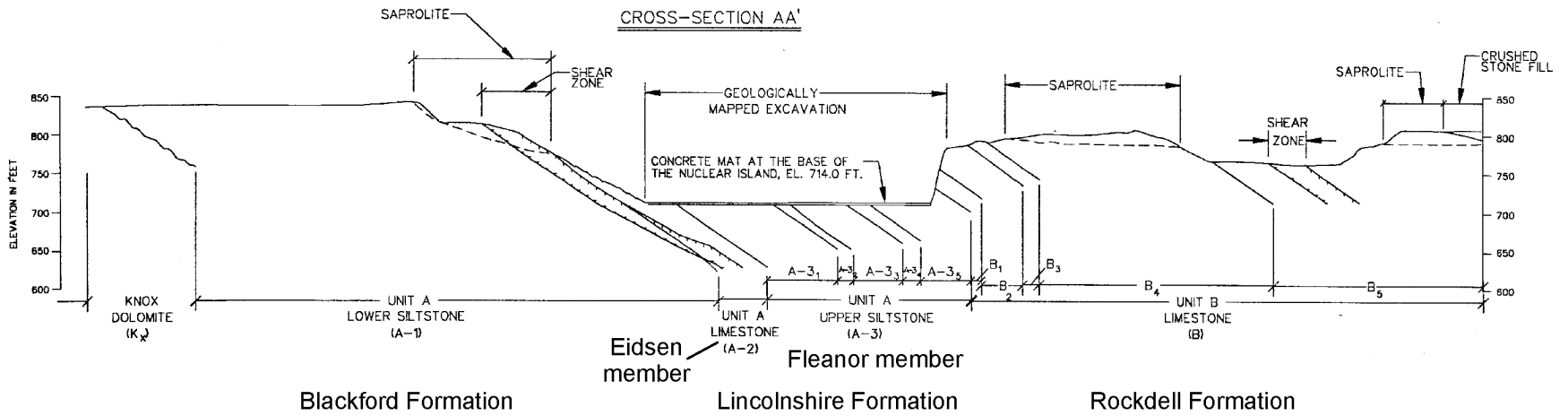
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Note: The “shear zone” identified in the CRBRP PSAR is referred to as shear-fracture zone in the current investigation.  
 Source: [Reference 2.5.1-238](#) (Illustration 7, surface projection of “shear zone”) and [Reference 2.5.1-303](#) (Plate 2, excavation map, with mapped “shear zones” and section line A-A’)

**Figure 2.5.1-91. (Sheet 2 of 3) Site Geologic Map Showing Excavation, Mapped “Shear Zones,” and Site Borings**

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Note: Profile line location shown on Sheet 2 of 3  
 Source: Reference 2.5.1-303

Figure 2.5.1-91. (Sheet 3 of 3) Cross Section of CRBRP Excavation Mapping





Source: [Reference 2.5.1-303](#)

**Figure 2.5.1-92. Apparent Fault Propagation Fold Exposed in CRBRP Excavation**