

149-900A-84R-4

**UNIT 18: BRECCIATED METAMORPHOSED MAFIC ROCK**

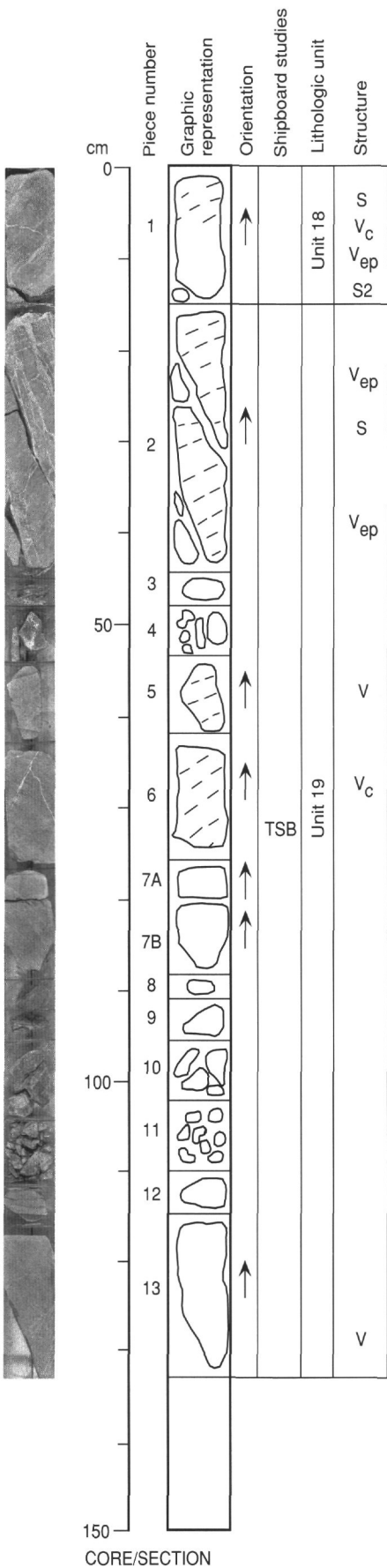
**Piece 1 only**

**CONTACTS:** Drawn at the base of Piece 1 where rock is fine-grained against zone of micro-brecciation.  
**PHENOCRYSTS:** None.  
**GROUNDMASS:** Plagioclase, chlorite, and amphibole.  
**VESICLES:** None.  
**COLOR:** Olive gray (5Y 3/2).  
**STRUCTURE:** Ductile foliation overprinted by fracturing and brecciation.  
**VEINS/FRACTURES:** 15%; up to 1 cm wide; variable; several generations of veins.

**UNIT 19: METAMORPHOSED MAFIC ROCK**

**Pieces 2-13**

**CONTACTS:** Top of unit is drawn at the top of Piece 2 and is marked by fine-grained material involved in low temperature shear deformation.  
**PHENOCRYSTS:** None.  
**GROUNDMASS:** Chlorite and amphibole?  
**VESICLES:** None.  
**COLOR:** Olive gray (5Y 3/2).  
**STRUCTURE:** Ductile foliation hardly visible in fine-grained rock, overprinted by slight fracturing.  
**VEINS/FRACTURES:** 2%; up to 3 mm wide; variable; two generations of veins.



CORE/SECTION

**UNIT 19: MAFIC ROCK**

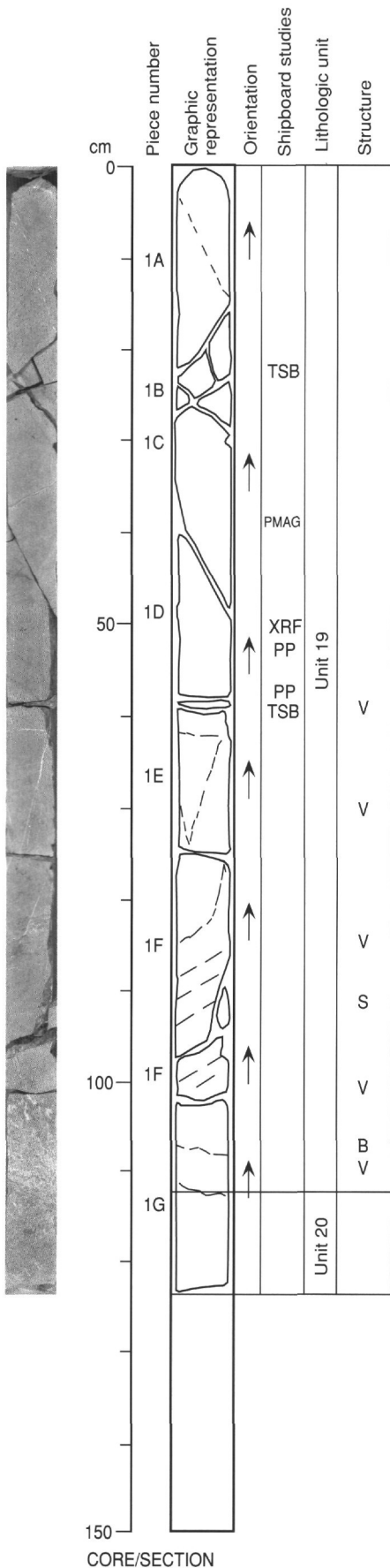
**Pieces 1A–1G (part)**

**CONTACTS:** Bottom of the unit is drawn at base of fine-grained section within Piece 1G, at contact with more brecciated, oxidized material.  
**PHENOCRYSTS:** No phenocrysts present.  
**GROUNDMASS:** Plagioclase, chlorite, and amphibole(?).  
**VESICLES:** None.  
**COLOR:** Dark greenish gray (5G 4/1).  
**STRUCTURE:** Fine-grained planar fabric except in Piece 1F where the fabric is more marked. Fabric is less visible near basal contact.  
**VEINS/FRACTURES:** Sparse 1 mm veins with chlorite. Some calcite veining and fracturing is much less obvious than in higher sections and probably makes up less than 3% of the unit in this section.  
**ADDITIONAL COMMENTS:** Unit continues from 149-900A-84R-4, Piece 2. Boundaries of units are somewhat subjective but both upper and lower contacts of Unit 19 are oxidized. In general only the central parts of unit shows a foliation.

**UNIT 20: MAFIC ROCK**

**Piece 1G (Part)**

**CONTACTS:** Upper contact is with Piece 1G and is marked by distinct oxidized brecciated zone.  
**PHENOCRYSTS:** No phenocrysts.  
**GROUNDMASS:** Chlorite and amphibole.  
**VESICLES:** None.  
**COLOR:** Dusk yellow green (5GY 5/2).  
**ALTERATION:** Rock is slightly oxidized giving brown/yellow color.  
**VEINS/FRACTURES:** A few 1 mm white irregular veins.  
**ADDITIONAL COMMENTS:** Unit continues in 149-900A-85R-02.



149-900A-85R-2

**UNIT 20: MAFIC ROCK**

**Pieces 1A–1E (Part)**

**CONTACTS:** Lower contact of unit is marked by a slightly oxidized zone within Piece 1E at approximately 85 cm.

**PHENOCRYSTS:** None.

**GROUNDMASS:** Chlorite, amphibole.

**VESICLES:** No vesicles.

**COLOR:** Dark greenish gray (5G 4/1).

**STRUCTURE:** Ductile foliation is well-developed, particularly in Pieces 1A thru 1C. However, fabric is less if not visible in lower part of Piece 1D and in 1E adjacent to the contact. The distribution of this fabric is critical to the identification of unit boundaries.

**VEINS/FRACTURES:** At least three phases of fracture/veins present including epidote, calcite, and a third white mineral phase. Veins are thin (1–3 mm) and form only 2%–3% of rock.

**ADDITIONAL COMMENTS:** Unit continues from 149-900A-85R-01.

**UNIT 21: MAFIC ROCK**

**Pieces 1E (part), 1F, and 1G**

**CONTACTS:** Upper contact is oxidized against lower part of Unit 20.

**PHENOCRYSTS:** No phenocrysts.

**GROUNDMASS:** Chlorite, amphibole.

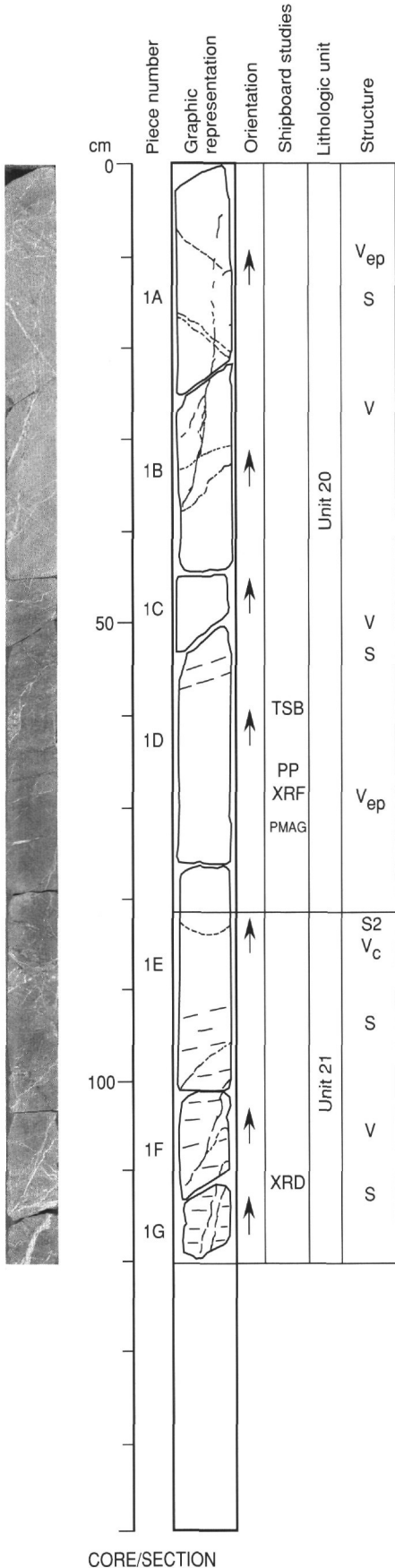
**VESICLES:** No vesicles.

**COLOR:** Dark greenish gray (5G 4/1).

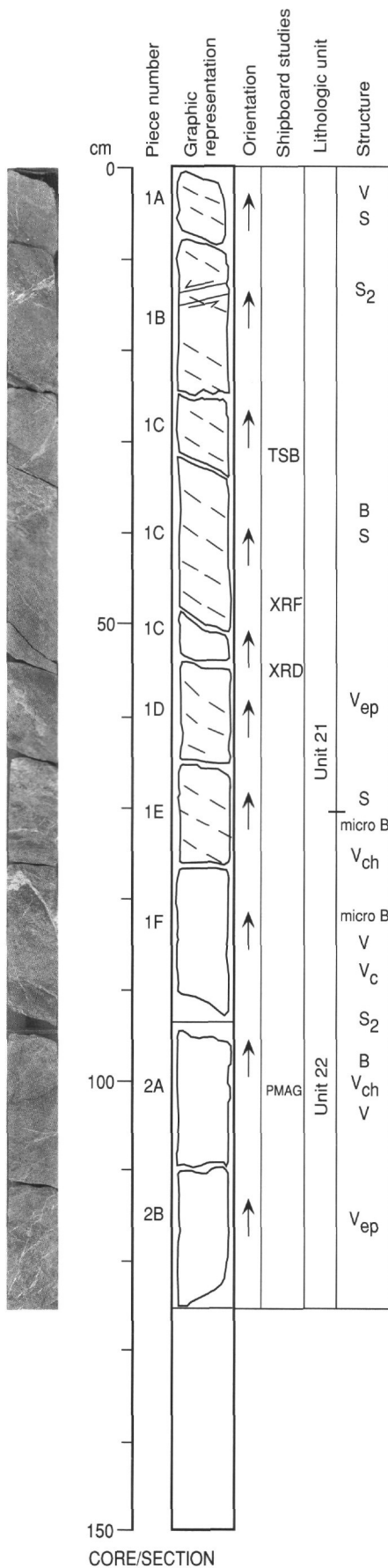
**STRUCTURE:** Marked ductile foliation cutting core at approximately right angles. Intensity of fabric increases in 149-900A-85R-3.

**VEINS/FRACTURES:** At least 4 stages of veining, including early dark gray to black zones marginal to narrow (1 mm) veins, and perhaps epidote, chlorite, and calcite veins.

**ADDITIONAL COMMENTS:** Unit continues in 149-900A-85R-3.



CORE/SECTION



**UNIT 21: MAFIC ROCK**

**Pieces 1A–TOP 1E**

**CONTACTS:** Transition is a fine-grained rock zone.  
**PHENOCRYSTS:** None.  
**GROUNDMASS:** Chlorite, amphibole, epidote.  
**VESICLES:** None.  
**COLOR:** Dark greenish gray (5G 4/1).  
**STRUCTURE:** Brecciation superimposed on ductile foliation.  
**VEINS/FRACTURES:** 10%; up to 1 cm; variable; large late veins filled with calcite, these cut an earlier set of veins.  
**ADDITIONAL COMMENTS:** This unit continues from 149-900A-85R-2.

**UNIT 22: MAFIC ROCK**

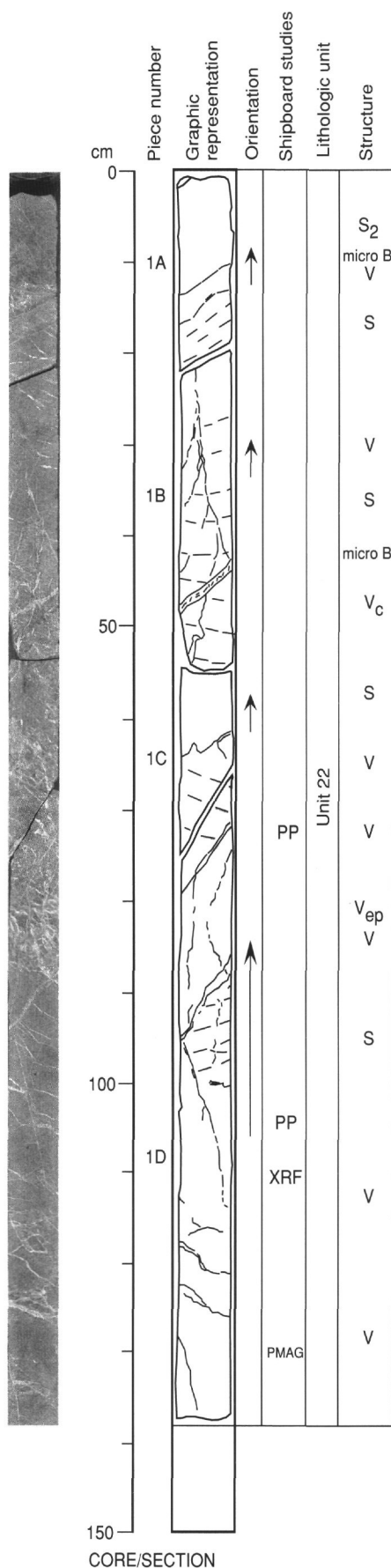
**Pieces LOWER 1E–2B**

**CONTACTS:** Contact is a fine-grained rock zone.  
**PHENOCRYSTS:** None.  
**GROUNDMASS:** Chlorite, amphibole, epidote.  
**VESICLES:** None.  
**COLOR:** Dark greenish gray (5G 4/1).  
**STRUCTURE:** Brecciation superimposed ductile foliation.  
**VEINS/FRACTURES:** 15%; up to 3 mm; Variable; Large late veins filled with calcite, these cut an earlier set of veins.  
**ADDITIONAL COMMENTS:** This unit continues into 149-900A-85R-4.

149-900A-85R-4

UNIT 22: MAFIC ROCK

Pieces 1A to 1D



**CONTACTS:** None in this section.

**PHENOCRYSTS:** None.

**GROUNDMASS:** Plagioclase, amphibole, and chlorite.

**VESICLES:** None.

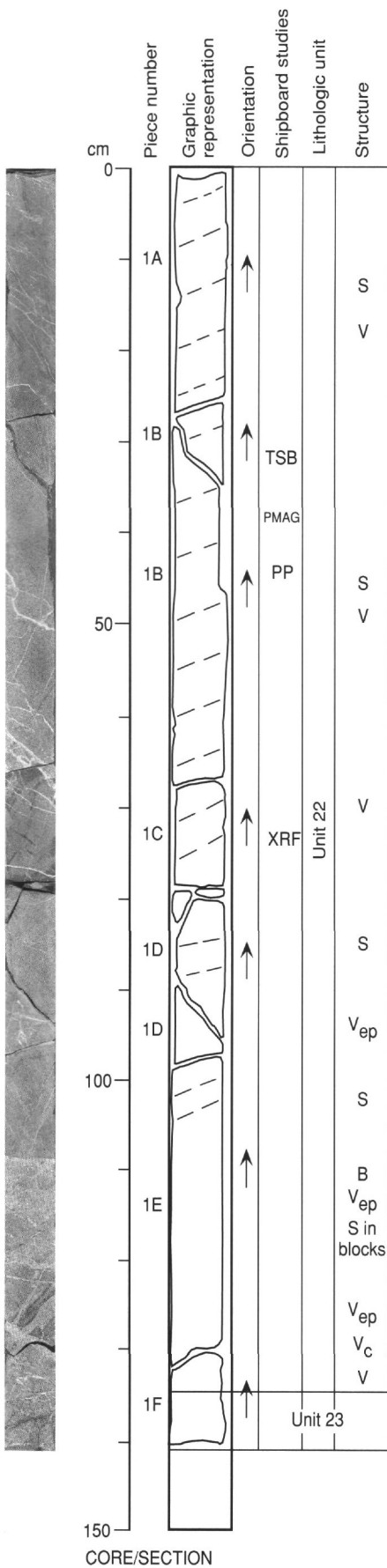
**COLOR:** Dark greenish gray (5G 4/1).

**STRUCTURE:** Fabric is very variable down length of section. 0–40 cm ductile foliation is relatively regular and fine-scaled. From 40–87 cm, fabric is less regular, coarser, and apparently broken by late stage veins and fractures. The lower part of Piece 1D again has a well-organized planar fabric, except for sections of brecciation near 120 cm.

**VEINS/FRACTURES:** Veins of calcite and earlier epidote are common, particularly from 40 to 90 cm

**ADDITIONAL COMMENTS:** 2 cm thick band of brecciation cuts the core obliquely between 12 and 18 cm.

CORE/SECTION



**UNIT 22: MAFIC ROCK**

**Pieces 1A to 1F (upper part)**

**CONTACTS:** Lower contact is within Piece 1F at 130 cm.  
**PHENOCRYSTS:** No phenocrysts.  
**GROUNDMASS:** Chlorite, plagioclase, amphibole.  
**VESICLES:** No vesicles.  
**COLOR:** Dark greenish gray (5G 4/1).  
**STRUCTURE:** Ductile foliation developed on a fine scale in Pieces 1A to 1D. Piece 1E shows intense brecciation between 110 and 130 cm superimposed on ductile fabric.  
**VEINS/FRACTURES:** Late stage calcite veins up to 10 mm thick cut earlier generation of epidote veins.  
**ADDITIONAL COMMENTS:** Unit is relatively massive and uniform, except at base.

**UNIT 23: MAFIC ROCK**

**Piece 1F (lower part)**

**CONTACTS:** Veined contact with overlying unit is within Piece 1F at 130 cm.  
**PHENOCRYSTS:** None.  
**GROUNDMASS:** Chlorite, plagioclase, and amphibole.  
**VESICLES:** No vesicles.  
**COLOR:** Dark greenish gray (5G 4/1).  
**STRUCTURE:** Ductile foliation within brecciated unit, overprinted by veins.  
**VEINS/FRACTURES:** Highly veined. Several generations present.  
**ADDITIONAL COMMENTS:** Placement of unit boundary is uncertain. Unit continues into Section 149-900A-85A-06.

149-900A-85R-6

UNIT 23: MAFIC ROCK

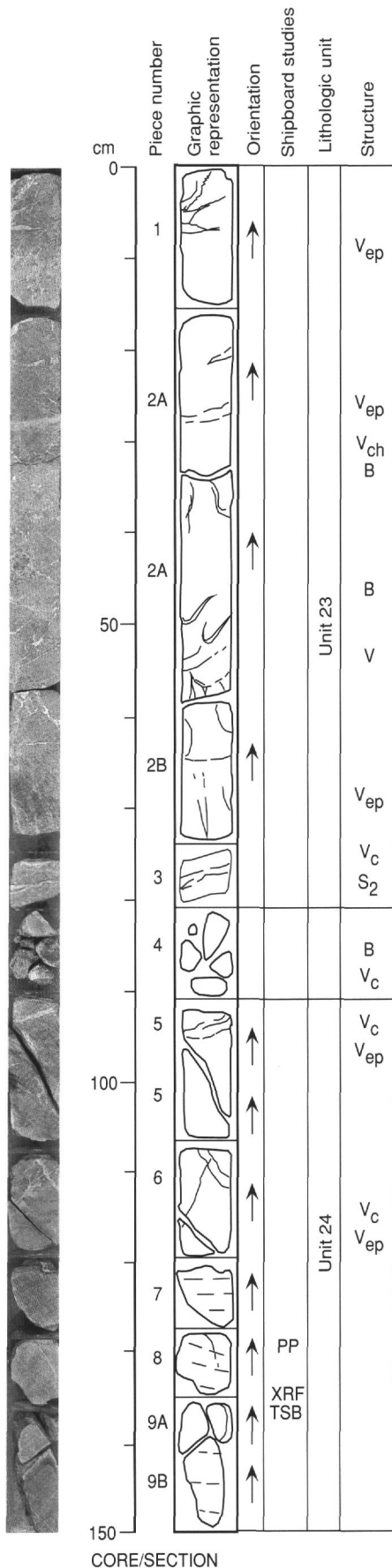
Pieces 1-3

**CONTACTS:** Lower boundary is drawn within drilling breccia of Piece 4.  
**PHENOCRYSTS:** None.  
**GROUNDMASS:** Plagioclase, amphibole, epidote.  
**VESICLES:** No vesicles.  
**COLOR:** Greenish gray (5G 6/1) to dark greenish gray (5G 4/1).  
**STRUCTURE:** Ductile deformation with superimposed later episodes of brecciation.  
**VEINS/FRACTURES:** Late stage calcite veins still present. Most veining is earlier epidote.  
**ADDITIONAL COMMENTS:** Probably 40% of this interval is brecciated.

UNIT 24: MAFIC ROCK

Pieces 5-9B

**CONTACTS:** Upper contact is within drilling breccia in Piece 4.  
**PHENOCRYSTS:** None.  
**GROUNDMASS:** Chlorite, plagioclase, amphibole.  
**VESICLES:** None.  
**COLOR:** Dark greenish gray (5GY 4/1).  
**STRUCTURE:** Ductile foliation developed on a small scale in Pieces 7, 8, and 9.  
**VEINS/FRACTURES:** At least three generations of veining. Earliest generation are zones of black alteration along thin veins (1 mm). At least two sets of epidote-filled veins and calcite brecciation is also present.  
**ADDITIONAL COMMENTS:** Unit continues into 149-900A-86R-1.



CORE/SECTION

149-900A-86R-1

**UNIT 24: MAFIC ROCK**

**Pieces 1-7**

**CONTACTS:** None.  
**PHENOCRYSTS:** None.  
**GROUNDMASS:** Chlorite, plagioclase, and amphibole.  
**VESICLES:** None.  
**COLOR:** Dark greenish gray (5GY 4/1).  
**STRUCTURE:** Planar fabric developed in most pieces, with superimposed brecciation.  
**VEINS/FRACTURES:** Several generation of veins present. Piece 2 is highly veined. Calcite and epidote veins are common.  
**ADDITIONAL COMMENTS:** Unit continues from 149-900A-85R-6.

