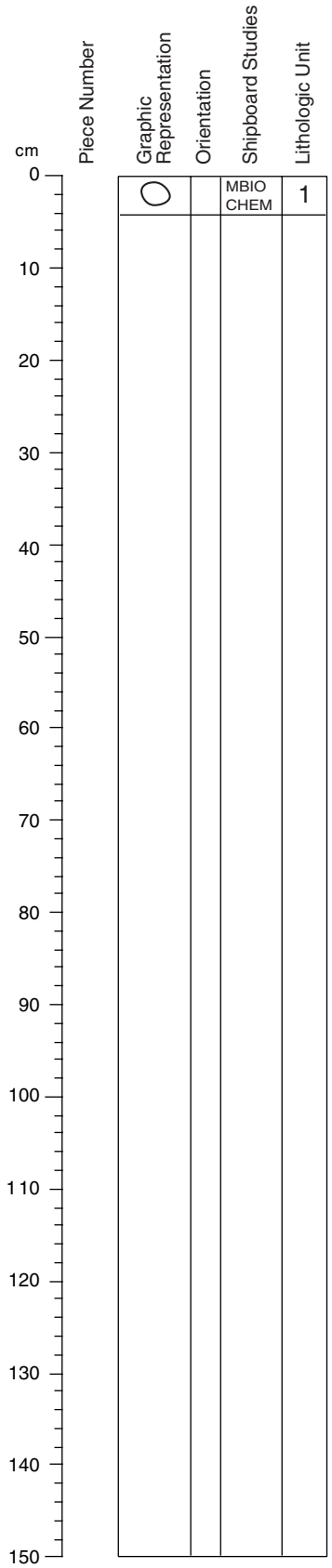
Core Photo



195-1200A-1R-1 (Section top: 0.0 mbsf)

ROCK NAME: Carbonate chimney fragment

UNIT: I

Piece:1

Interval: 0-4 cm

MINERALOGY:

	% Mode	Grain Size (mm): Max	Min	Avg.	Shape/Habit
Olivine (original):					
Pyroxene (original):					
Serpentine:					
Opaques:					
Other (aragonite):	99				
Brucite:	tr				

COLOR: white

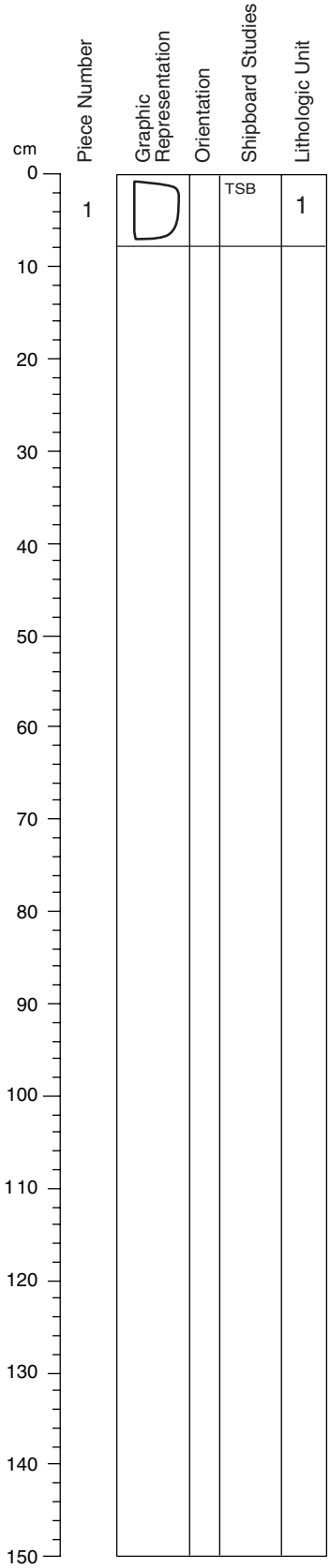
STRUCTURE: Porous agglomerate of interlocking aragonite needles and crust.

VEINS/FRACTURES: None.

COMMENTS: One piece of rock was recovered. This sample was used for microbiological investigations. The sample is similar to material collected during submersible dives at this site and represents a precipitate from interaction between high alkalinity (carbonate alkalinity), vent fluids, and seawater.

A core photo was not taken for 1200A-1R-1.

Core Photo



195-1200A-2R-1 (Section top: 9.7 mbsf)

ROCK NAME: Serpentinite (after harzburgite)

UNIT: 1

Pieces: 1

Interval: 0-8 cm

MINERALOGY:	% Mode	Grain Size (mm): Max	Min	Avg.	Shape/Habit
Olivine (original):	90				
Pyroxene (original):	9				
Serpentine:	99				Massive to bastitic and fibrous in veins.
Opaque Minerals:	1				Subhedral chromite and fine, dusty magnetite.
Other:	tr				

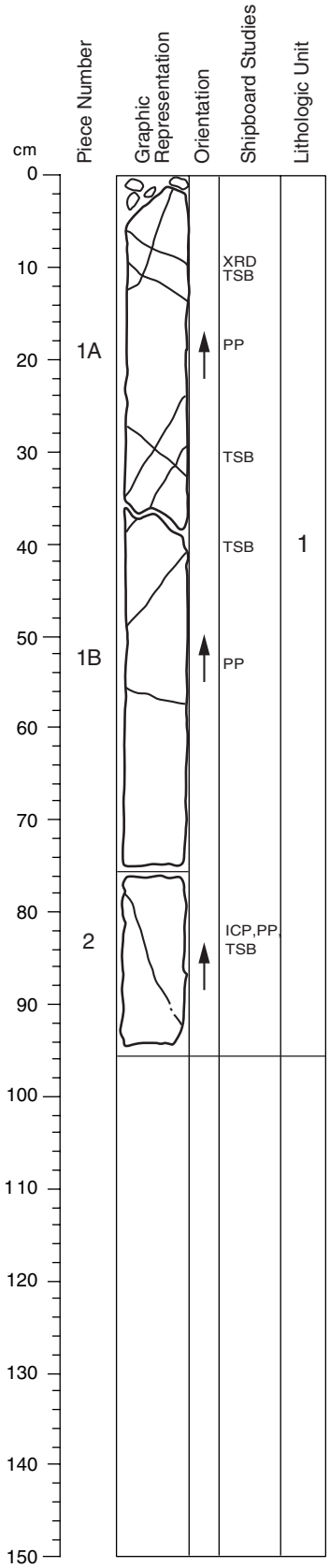
COLOR: Dark bluish gray (5B 4/1).

STRUCTURE: Massive, but there is a rim of lighter material and a core of dark partially unserpentinized harzburgite.

VEINS/FRACTURES: Few very small serpentine veins observed.

COMMENTS: The alteration aureole around the piece is, on inspection in thin section, totally serpentinized although the interior of the piece has some relict olivine and pyroxene.

Core Photo



195-1200A-3R-1 (Section top: 18.2 mbsf)

ROCK NAME: Serpentinized harzburgite

UNIT: 1

Pieces: 1a, 1b, and 2

Interval: 0-95 cm

MINERALOGY:	% Mode	Grain Size (mm): Max	Min	Avg.	Shape/Habit
Olivine (original):	90				
Pyroxene (original):	8				
Serpentine:	90-95				Massive to bastitic and fibrous in veins.
Opaque Minerals:	1				Irregular to subhedral chromite and fine, dusty magnetite grains.
Other:	1				

COLOR: Bluish-gray (5B 5/1).

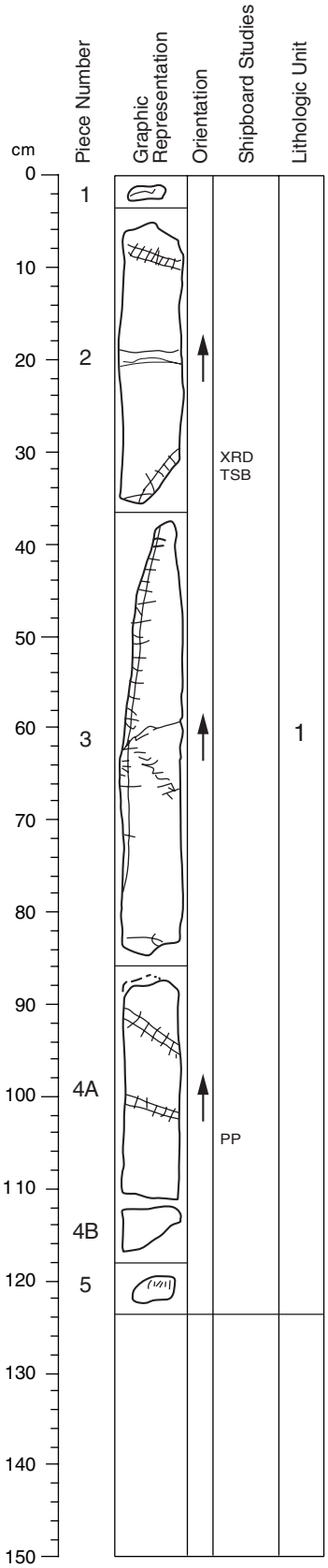
STRUCTURE: The section is fine-grained in the upper part and has a sharp boundary (at 38-40 cm) to coarse-grained bastite serpentinite.

VEINS/FRACTURES: The pieces have fine to very fine serpentine veins (possibly chrysotile). There are at least three generations of veins that cross-cut each other. It seems that the chrysotile vein generation is the youngest one.

1200A-4R-1 NO RECOVERY

1200A-5R-1 NO RECOVERY

Core Photo



195-1200A-6R-1 (Section top: 41.4 mbsf)

ROCK NAME: Serpentinite (after harzburgite)

UNIT: 1

Pieces: 1, 2, 3, 4a, 4b, and 5

Interval: 0 - 124 cm

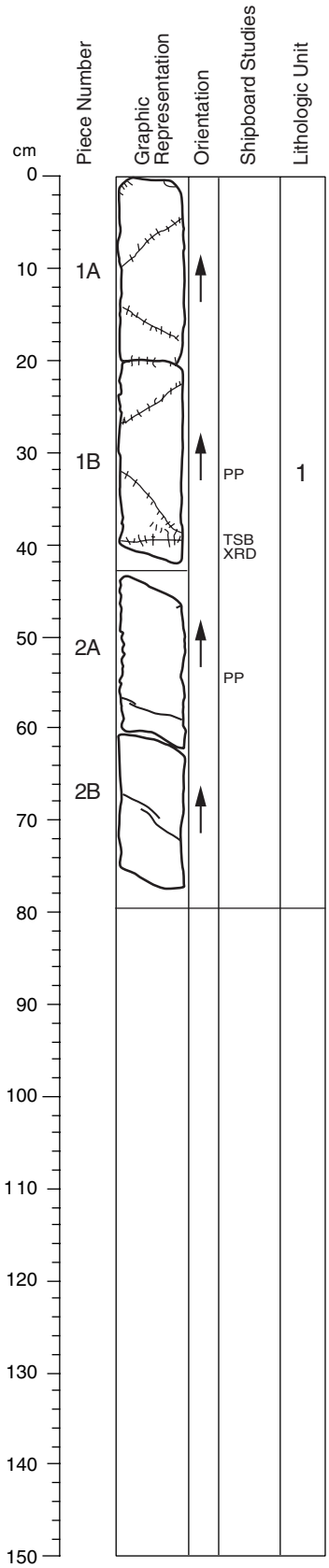
MINERALOGY:	% Mode	Grain Size (mm): Max	Min	Avg.	Shape/Habit
Olivine (original):	70-80	1			
Pyroxene (original):	10-30	5	<1	2	Euhedral
Serpentine:	75-85				Massive to bastitic and fibrous in veins.
Opaque Minerals:	1	>1			Irregular to subhedral chromite or magnesiochromite and fine, dusty magnetite.
Other:	tr				

COLOR: Dark black gray (5B 4/1).

STRUCTURE: The rocks are serpentinized to various degrees. The serpentine replaces olivine and pyroxene. Bastitic serpentine texture indicates the replacement of pyroxene by serpentine. Some rocks from this core look fresher compared to other cores and are appropriate for chemical analysis.

VEINS/FRACTURES: Pieces are heavily veined, with veins cross-cutting each other. There are at least 3 generations of veins present, with one of them identified as chrysotile (especially Piece 3, which contains 35-cm long vein). Central veins cross-cut by subsidiary veins that pinch out at variable distances from the central vein are common.

Core Photo



195-1200A-6R-2 (Section top: 42.66 mbsf)

ROCK NAME: Serpentinite (after harzburgite)

UNIT: 1

Pieces: 1a, 1b, 2a, and 2b

Interval: 0 - 80 cm

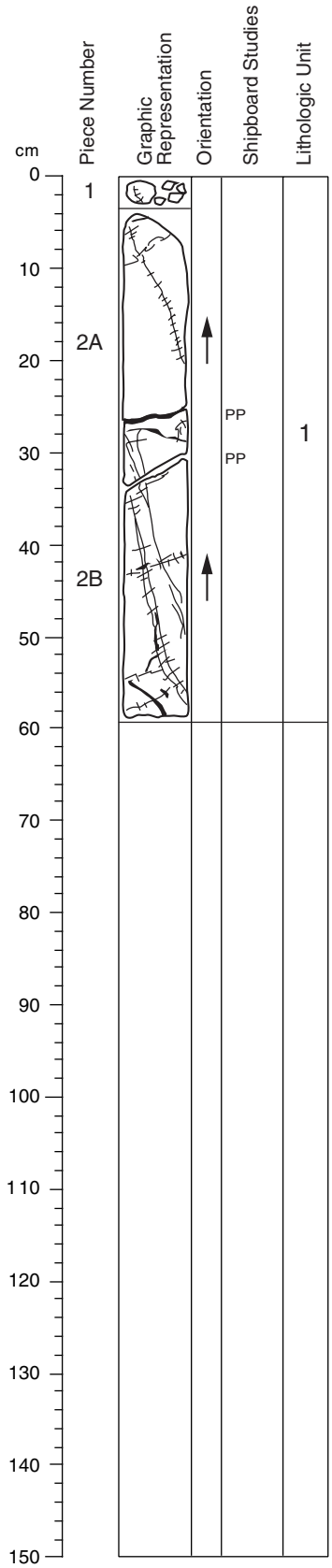
MINERALOGY:	% Mode	Grain Size (mm): Max	Min	Avg.	Shape/Habit
Olivine (original):	80				
Pyroxene (original):	15-20				
Serpentine:	99		>1	>1	Massive to bastitic and fibrous in veins.
Opaque Minerals:	1	>1			Subhedral chromite or magnesiochromite and fine, dusty magnetite.
Other:	tr				

COLOR: Dark bluish gray (10B 4/1).

STRUCTURE: The rock is highly serpentinized. The serpentine replaces olivine and pyroxene. Bastitic serpentine texture indicates the replacement of pyroxene by serpentine.

VEINS/FRACTURES: Multiple generations of veins of a white to greenish material are observed. Central veins cross-cut by subsidiary veins that pinch out at variable distances from the central vein are common.

Core Photo



195-1200A-7R-1 (Section top: 51.1 mbsf)

ROCK NAME: Serpentinite (after harzburgite)

UNIT: 1

Pieces: 1, 2a, and 2b

Interval: 0 - 59 cm

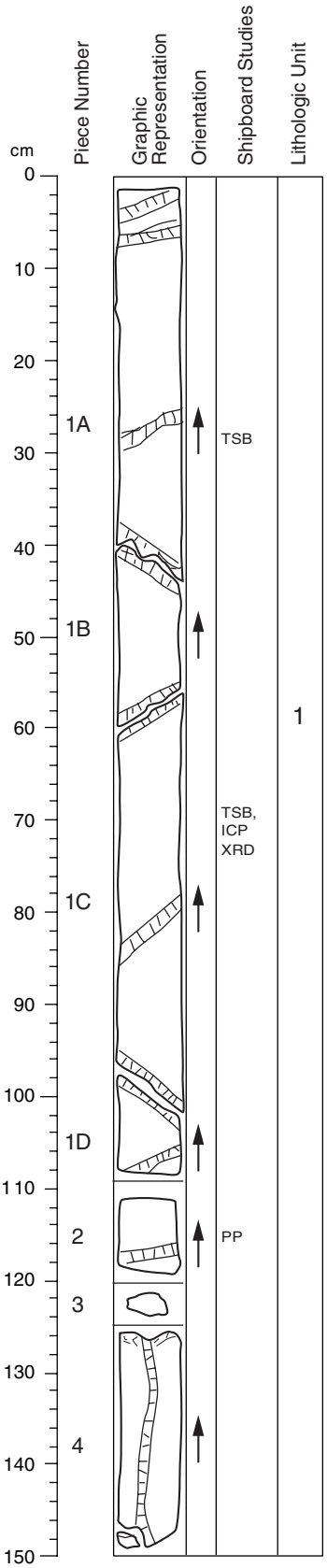
MINERALOGY:	% Mode	Grain Size (mm): Max	Min	Avg.	Shape/Habit
Olivine (original):	59				
Pyroxene (original):	40				
Serpentine:	99		>1	>1	Massive to bastitic and fibrous in veins.
Opaque Minerals:	tr	>1			Irregular to subhedral chromite or magnesiochromite and fine, dusty magnetite.
Other:	tr				

COLOR: Dark greenish gray (10BG 4/1).

STRUCTURE: The rock is highly serpentinized. Serpentine replaces olivine and pyroxene. Bastitic serpentine texture indicates replacement of pyroxene by serpentine. There is a network of dark fractures that preceded the vein formation.

VEINS/FRACTURES: Multiple generations of veins with central veins cross-cut by subsidiary veins that pinch out at variable distances from the central vein. The width of the cross-veining increases with width of the central vein (“Frankenstein” veins). There are also dark veins with no cross-cutting features. Some are flanked by light veins.

Core Photo



195-1200A-7R-2 (Section top: 51.69 mbsf)

ROCK NAME: Serpentinite (after harzburgite)

UNIT: 1

Pieces: 1a, 1b, 1c, 1d, 2, 3, and 4

Interval: 0-150 cm

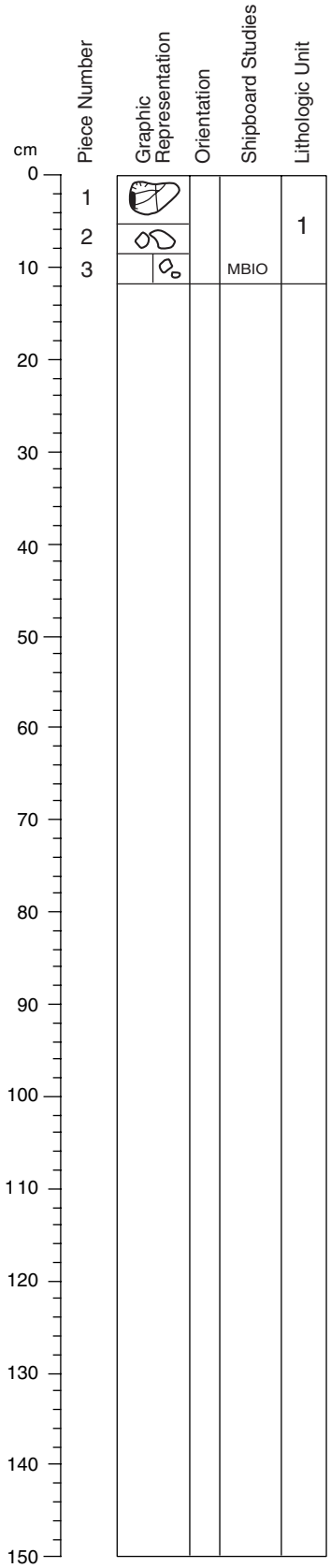
MINERALOGY:	% Mode	Grain Size (mm): Max	Min	Avg.	Shape/Habit
Olivine (original):					
Pyroxene (original):					
Serpentine:	99				Massive to bastitic and fibrous in veins.
Opaque Minerals:	tr				Irregular chromite and fine, dusty magnetite.
Other:	tr				

COLOR: Dark greenish gray (10BG 4/1).

STRUCTURE: Piece 4 was originally intergranular, and now consists of bastitic replacement of original pyroxene grains by serpentine.

VEINS/FRACTURES: Fine veins are seen in all pieces. Pieces 1 and 4 have multiple generations of veining. Large central veins have fine subsidiary, cross-cutting veinlets tapering into the matrix.

Core Photo



195-1200A-8R-1 (Section top: 60.7 mbsf)

ROCK NAME: Serpentinite (mainly after harzburgite)

UNIT: 1

Pieces: 1, 2, and 3

Interval: 0 - 13 cm

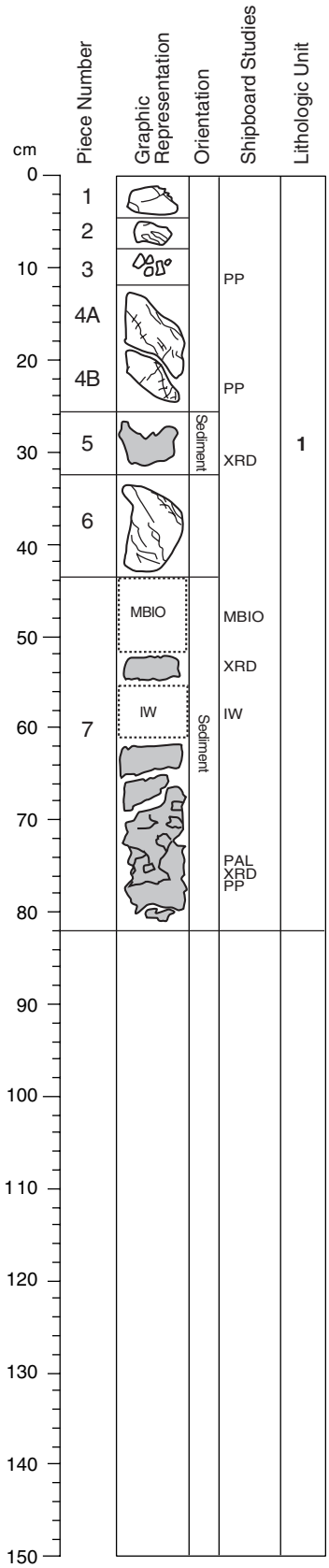
MINERALOGY:	% Mode	Grain Size (mm): Max	Min	Avg.	Shape/Habit
Olivine (original):	89				
Pyroxene (original):	10				
Serpentine:	99		>1	>1	Massive to bastitic and fibrous in veins.
Opaque Minerals:	tr	>1			Euhedral chromite and fine, dusty magnetite.
Other:	tr				

COLOR: Dark bluish gray to greenish gray (10B 4/1 to 10G 6/1).

STRUCTURE: The rock is highly serpentinized. Serpentine replaces olivine and pyroxene. Bastitic serpentine texture indicates replacement of pyroxene by serpentine. There is a network of dark fractures that preceded the vein formation. The two pieces in the second compartment (5.5 to 8.5 cm) are lighter gray in part. There is a small amount of gray mud (silty clay-sized unconsolidated serpentine mud) with clasts of various sizes of hard rock included in the matrix.

VEINS/FRACTURES: There are dark veins with no cross-cutting features in Piece 1.

Core Photo



195-1200A-9R-1 (Section top: 70.4 mbsf)

ROCK NAME: Serpentinite (after harzburgite)

UNIT: 1

Pieces: 1, 2, 3 (6 pebbles), 4a, 4b, 5, 6

Interval: 0-81 cm

MINERALOGY:	% Mode	Grain Size (mm): Max	Min	Avg.	Shape/Habit
Olivine (original):					
Pyroxene (original):					
Serpentine:	99				Massive to bastitic and fibrous in veins.
Opaque Minerals:	tr				Subhedral chromite and fine, dusty magnetite.
Other:	tr				

COLOR: Dark greenish gray, greenish gray to dark bluish gray (10G 4/1, 6/5BG to 5B 4/1).

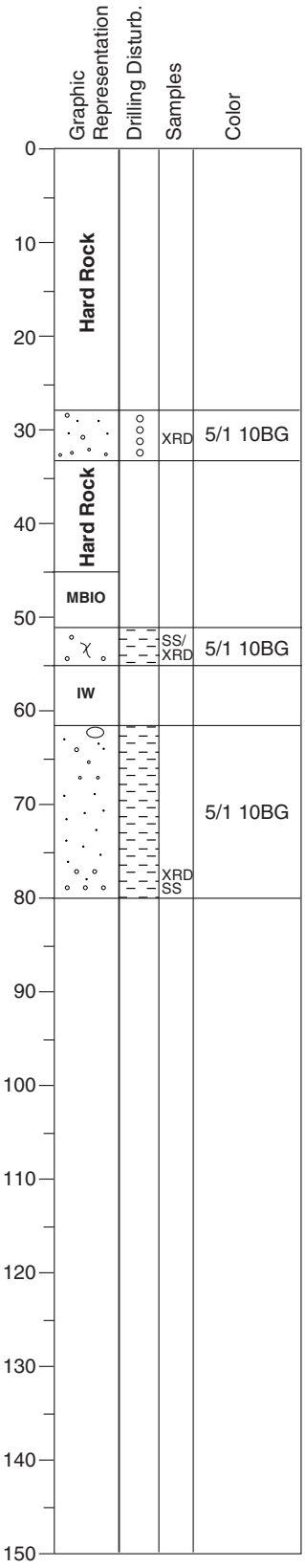
STRUCTURE: Piece 4 is heavily sheared.

VEINS/FRACTURES: Veins are observed in all the larger pieces. In Piece 1 are light greenish gray (5BG 8/1) veins. In Piece 2, two tapering veinlets of a blue fibrous (serpentine?) mineral are observed. In Piece 4 there is one large vein of light gray-green (10G 7/1) serpentine with cross-cutting veins of both pale gray to white material and dark gray material.

COMMENTS: Piece 5 is a clump of unconsolidated clay-to silt- sized, bluish gray (10BG 6/1) serpentine mud, enclosing small fragments of rock. The material below Piece 6 is finely comminuted serpentine. The material is clay-to silt-sized serpentine, unconsolidated and enclosing small (grit-sized) fragments of rocks of various lithologies.

See next page for Sediment Descriptions.

Core Photo



VISUAL CORE DESCRIPTION
SEDIMENTS/SEDIMENTARY ROCKS

195-1200A-9R-1

Poorly-sorted, greenish gray sand-silt-clay-sized serpentine with few granules and rare pebbles.

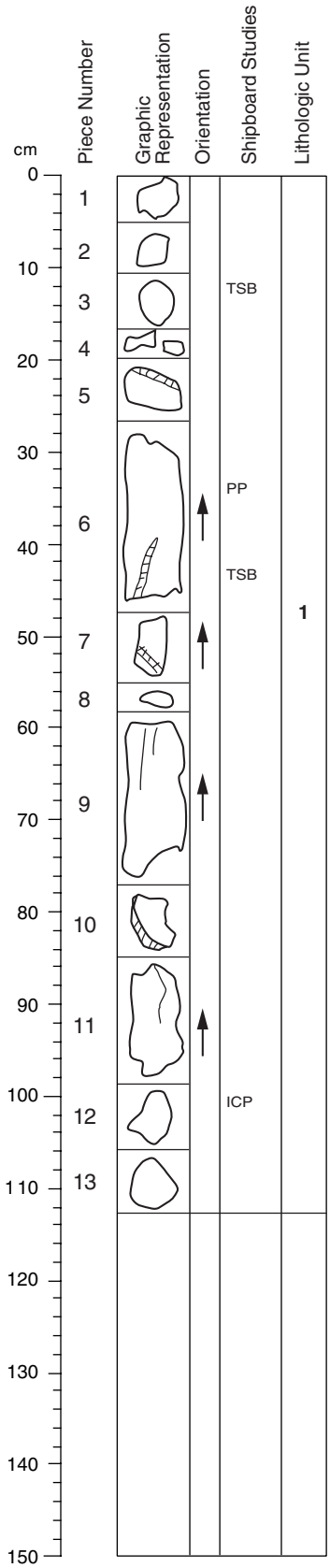
5/1 10BG (Greenish gray) [5/1 5B, bluish gray when freshly cut 24 hours ago]

28-32 cm: Soupy drilling slurry; rare angular ultramafic granules.

52-55 cm: Slightly stiffer than interval 28-32 cm above. Includes fibrous chrysotile(?) and few ultramafic granules. Stiffer interval is slightly darker.
(χ) Fibrous chrysotile.

62-80 cm: Slightly stiffer at the top 1 cm with a subrounded ultramafic pebble. The remainder of this interval is firm slurry with abundant subangular to rounded, sand-sized and granule-sized ultramafics, plus rare subangular to rounded pebble-sized ultramafics. Fibrous chrysotile throughout.

Core Photo



195-1200A-10R-1 (Section top: 79.9 mbsf)

ROCK NAME: Serpentinite (after harzburgite)

UNIT: 1

Pieces: 1-13

Interval: 0-113 cm

MINERALOGY:	% Mode	Grain Size (mm): Max	Min	Avg.	Shape/Habit
Olivine (original):					
Pyroxene (original):					
Serpentine:	99				Massive to bastitic and fibrous in veins.
Opaque Minerals:	tr				Irregular to subhedral chromite and fine, dusty, magnetite.
Other:	tr				

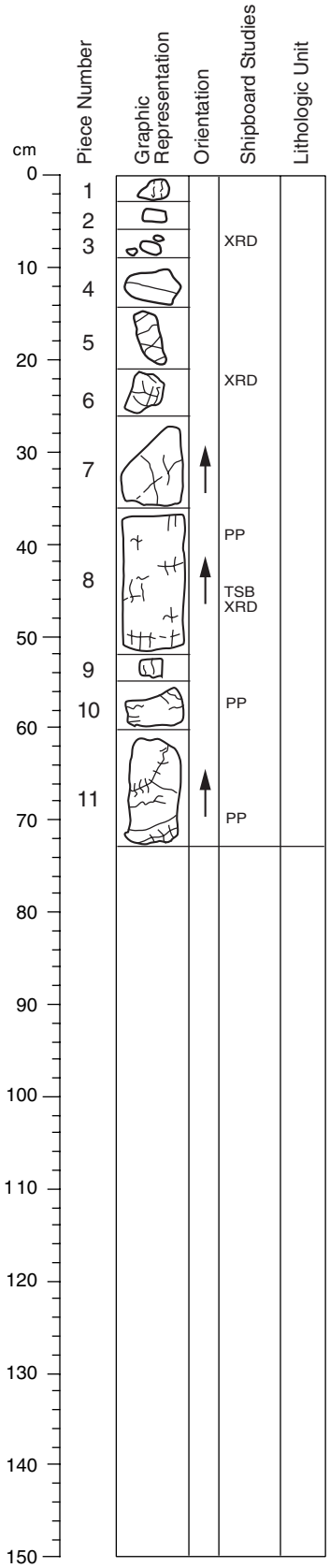
COLOR: The color varies from bluish gray to dark bluish gray (5B 6/1 to 5B 4/1)

STRUCTURE: Intensely sheared - possibly prior to serpentinization.

VEINS/FRACTURES: There are no visible veins in most pieces. Pieces 6, 7, and 9 have narrow cross cut veinlets.

COMMENTS: Pieces 1 to 4 all show the original external well-rounded to sub-rounded shape. These clasts are each small enough to fit between drill bit rollers. Pieces 5 to 13 may be from different rock fragments (they do not fit together), but each has similar texture and color, with disaggregated bastite ~10% in a uniformly fine-grained, dark gray-bluish matrix. Pieces 12 and 13 (like Pieces 1 to 4) also show original well-rounded clast shape. These rocks were obviously well- to sub-rounded during transport upward to the present position.

Core Photo



195-1200A-11R-1 (Section top: 89.4 mbsf)

ROCK NAME: Serpentinite (after harzburgite)

UNIT: 1

Pieces: 1-11

Interval: 0-72 cm

MINERALOGY:	% Mode	Grain Size (mm): Max	Min	Avg.	Shape/Habit
Olivine (original):					
Pyroxene (original):					
Serpentine:	99				Massive to bastitic and fibrous in veins.
Opaque Minerals:	tr				Subhedral chromite and fine, dusty magnetite.
Other:	tr				

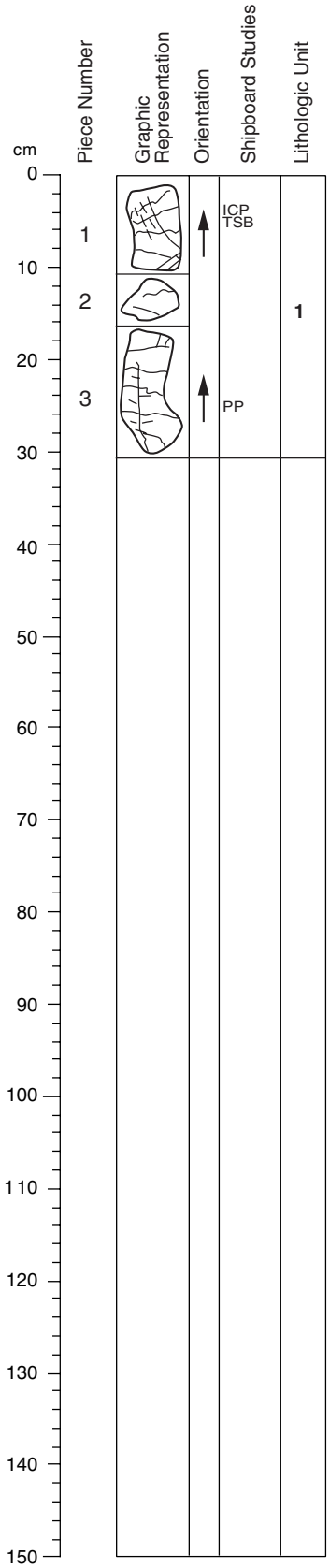
COLOR: Most pieces have a very dark gray to dark bluish gray (N3/ to 5B 4/1) color. Piece 1 is greenish gray (5BG 5/1) and Pieces 8 and 9 have a dark reddish brown (2.5/2) color.

STRUCTURE: Pieces 7, 8, and11 have a bastitic texture where the pyroxene has been replaced by serpentine.

VEINS/FRACTURES: Most of the pieces have thin cross-cutting veins of a greenish gray material. Piece 11 has bigger (up to 2 mm wide) veins of a dark greenish material that are cross-cut by smaller thin veinlets (approximately 6 mm- 10 mm in length) of a white material.

COMMENTS: Piece 1 is distinct by being highly sheared and showing minerals with preferred orientation. Piece 10 has an alteration rim along the edge of the clast, where it is now a lighter yellow greenish color. Pieces 3a, 3b, and 3c have a bronze colored mineral (mica?).

Core Photo



195-1200A-12R-1 (Section top: 99.0 mbsf)

ROCK NAME: Serpentinite (after harzburgite)

UNIT: 1

Pieces: 1-3

Interval: 0-30 cm

MINERALOGY:	% Mode	Grain Size (mm): Max	Min	Avg.	Shape/Habit
Olivine (original):					
Pyroxene (original):					
Serpentine:	99				Massive to bastitic and fibrous in veins.
Opaque Minerals:	tr				Subhedral chromite and fine, dusty magnetite.
Other:	tr				

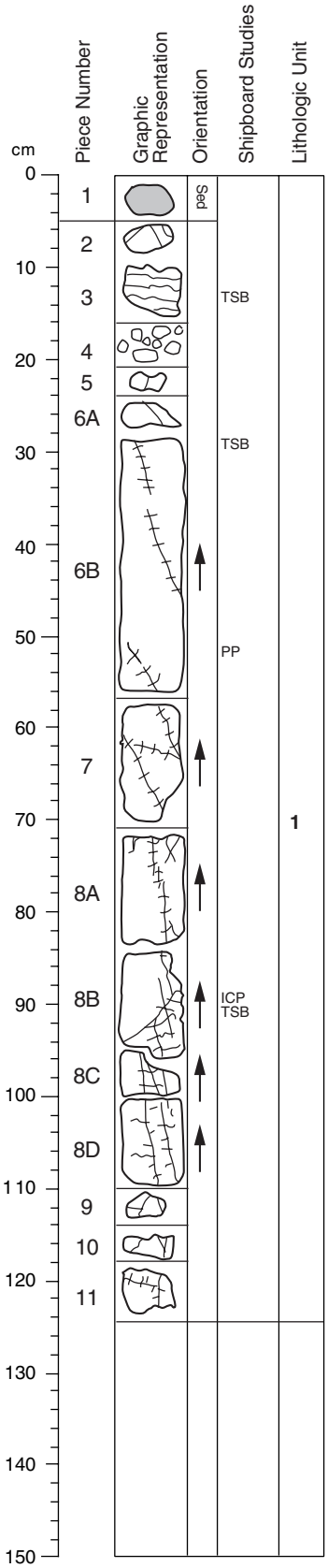
COLOR: Dark bluish gray (5B 4/1).

STRUCTURE: All the pieces have a bastitic texture where pyroxene has been replaced by serpentine. Piece 2 has individual patches of former pyroxene grains that are up to a centimeter or more in diameter.

VEINS/FRACTURES: Pieces 1 and 3 have veins of a greenish gray to black material (chlorite).

COMMENTS: Piece 1 appears to have been altered by metasomatism. There is a central (but offset) region of bastitic serpentinite that is surrounded by an aureole from 2.5 to 3.5 cm thick of alteration grading to a lighter green at the edges of the piece.

Core Photo



195-1200A-13R-1 (Section top: 108.7 mbsf)

ROCK NAME: Serpentinite (mainly after harzburgite)

UNIT: 1

Pieces: 2-11

Interval: 0-125 cm

MINERALOGY:

	% Mode	Grain Size (mm): Max	Min	Avg.	Shape/Habit
Olivine (original):					
Pyroxene (original):					
Serpentine:	80-99				Massive to bastitic and fibrous in veins.
Opaque Minerals:	tr				Euhedral to subhedral chromite and fine, dusty magnetite.
Other:	tr				

COLOR: Dark bluish gray (5B 4/1).

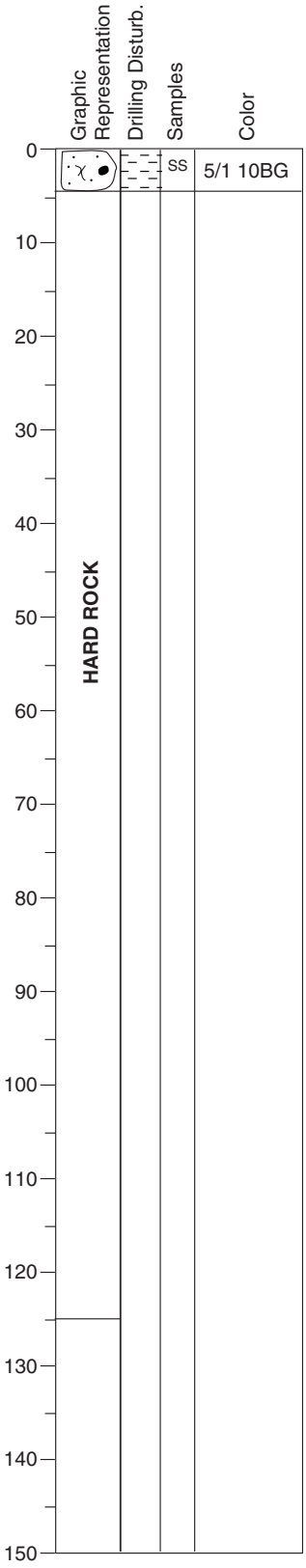
STRUCTURE: Pieces 2, 5, 6a, 6b, 7, 8a, 8b, 8c, 8d, and 11 all have a bastitic texture where the pyroxene has been replaced by serpentine.

VEINS/FRACTURES: All the pieces except Piece 4 (small clasts recovered in serpentinite mud) have veins of variable thickness up to 5 mm. The central veins are often cross-cut by finer subsidiary veins up to 10 mm long that pinch out at variable distances from the central vein. The veins generally vary from a darker bluish green (chlorite?) to a lighter material in the central veins, and from grayish green to white in the finer subsidiary cross-cutting veins.

COMMENTS: Piece 2 has an outer aureole of alteration up to 10 mm thick.

See next page for Sedimentary Descriptions.

Core Photo



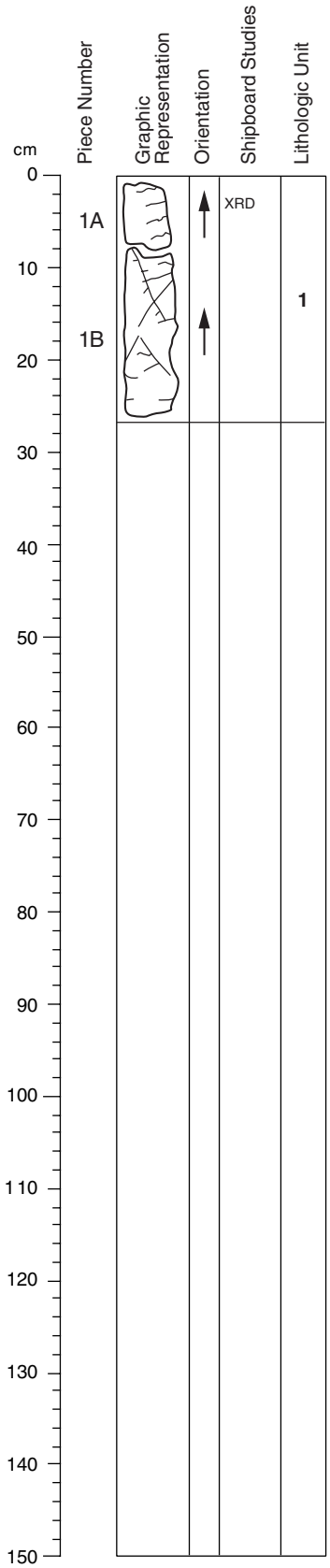
VISUAL CORE DESCRIPTION
SEDIMENTS/SEDIMENTARY ROCKS

195-1200A-13R-1

Poorly sorted, greenish gray, sand-silt-clay-sized serpentine with few granules and rare pebbles.

0-3 cm: Drilling slurry, soft to touch. Abundant sand-sized ultramafics. One subrounded ultramafic pebble (1 cm). Fibrous chrysotile(?) filaments throughout.

Core Photo



195-1200A-13R-2 (Section top: 109.95 mbsf)

ROCK NAME: Serpentinite (mainly after harzburgite)

UNIT: 1

Pieces: 1a and 1b

Interval: 0-26 cm

MINERALOGY:

	% Mode	Grain Size (mm): Max	Min	Avg.	Shape/Habit
Olivine (original):	85				
Pyroxene (original):	13				
Serpentine:	98				Massive to bastitic and fibrous in veins.
Opaque Minerals:	tr				Subhedral(?) chromite and fine, dusty magnetite.
Other:	tr				

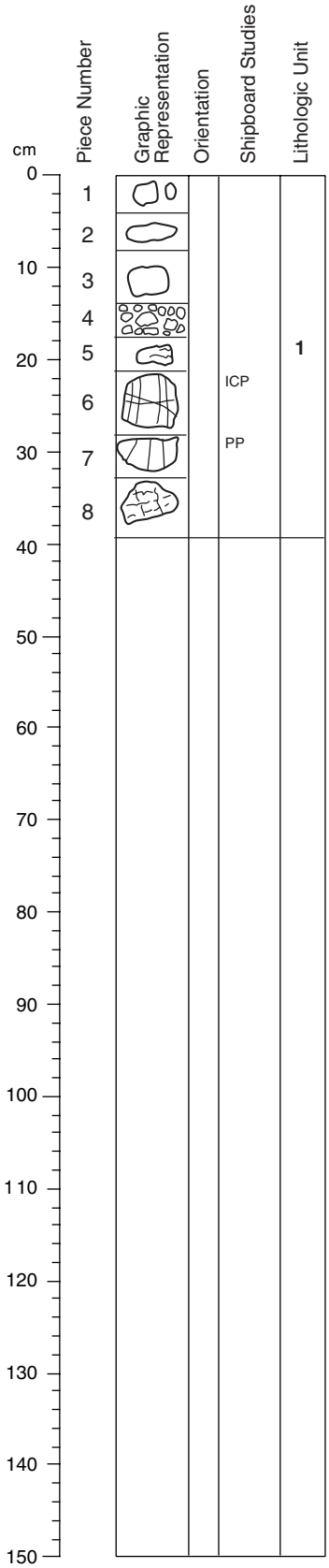
COLOR: Dark bluish gray (5B 4/1).

STRUCTURE: This piece was originally intergranular and has been serpentinized to a bastitic texture, where pyroxene has been replaced by serpentine.

VEINS/FRACTURES: Many small and thin veins approximately 5-10 mm long cross-cut the pieces in the bastitic portion of the cut face. Piece 1a and the upper half of Piece 1b have a ~2 cm wide vein of dark greenish black serpentine that is cross veined with white to pale whitish green material (chrysotile). White fibrous chrysotile is present in the 20 mm wide vein along with a second blue-green mineral.

COMMENTS: These pieces are very highly altered, with numerous veins.

Core Photo



195-1200A-14R-1 (Section top: 118.3 mbsf)

ROCK NAME: Serpentinite (mainly after harzburgite)

UNIT: 1

Pieces: 1-8

Interval: 1-39 cm

MINERALOGY:

	% Mode	Grain Size (mm): Max	Min	Avg.	Shape/Habit
Olivine (original):					
Pyroxene (original):					
Serpentine:	99				Massive to bastitic and fibrous in veins.
Opaque Minerals:	tr				Irregular to subhedral chromite or magnesiochromite and fine, dusty magnetite.
Other:	tr				

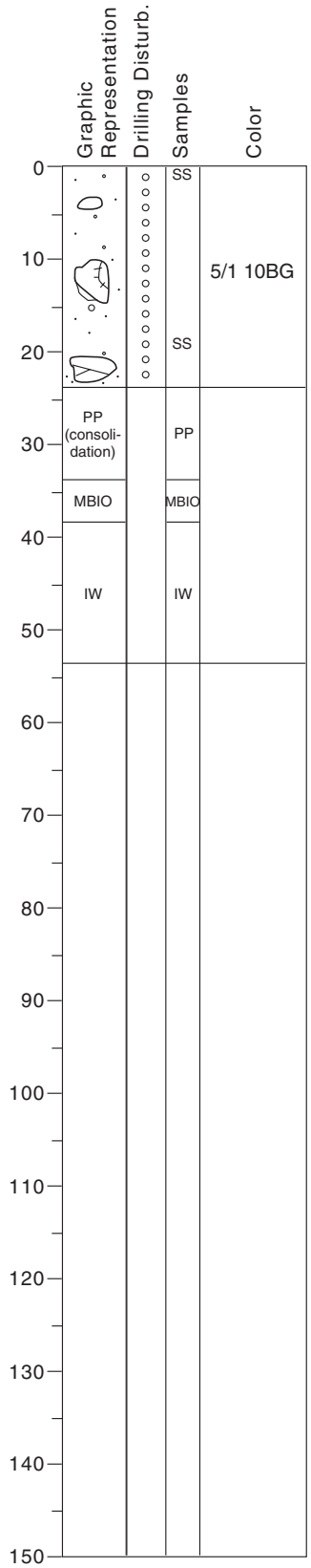
COLOR: Pieces 1 to 4 are greenish gray (10G 6/1) and Pieces 5 to 8 are dark bluish gray (5B 4/1).

STRUCTURE: The rocks are highly deformed and serpentinized. Serpentine replaces olivine and pyroxene. The alignment of altered olivine grains and foliated rock parts indicate mylonitization. The fine grained nature of the common minerals and the concentration of dark layers of fine-grained, opaque minerals in Pieces 5 to 8 are characteristic.

VEINS/FRACTURES: No veins are visible in Pieces 5 to 8.

COMMENTS: Pieces 5 to 8 have a network of dark fractures.

Core Photo



VISUAL CORE DESCRIPTION
SEDIMENTS/SEDIMENTARY ROCKS

195-1200A-15R-1
Poorly-sorted, greenish gray sand-silt-clay-sized serpentine with granules and rare pebbles (serpentinized harzburgite clasts emplaced in drilling slurry).

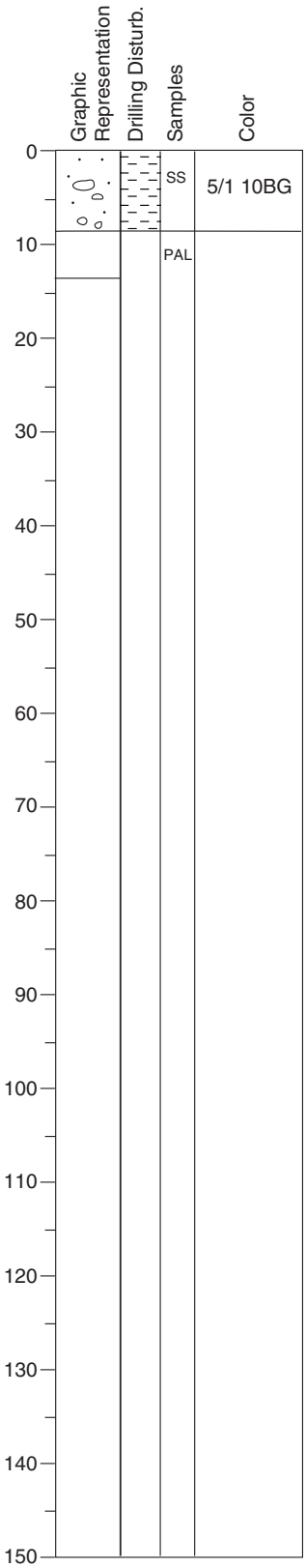
0-23 cm: Soupy drilling slurry. Three subangular serpentinized harzburgite clasts and few ultramafic granules/ pebbles in slurry. Clasts range from 3 to 7 cm (long-axis).

Felt-like texture with chrysotile fibres throughout.

Sharp end boundary defined by the end-cap.

23-53 cm: Whole round samples.

Core Photo



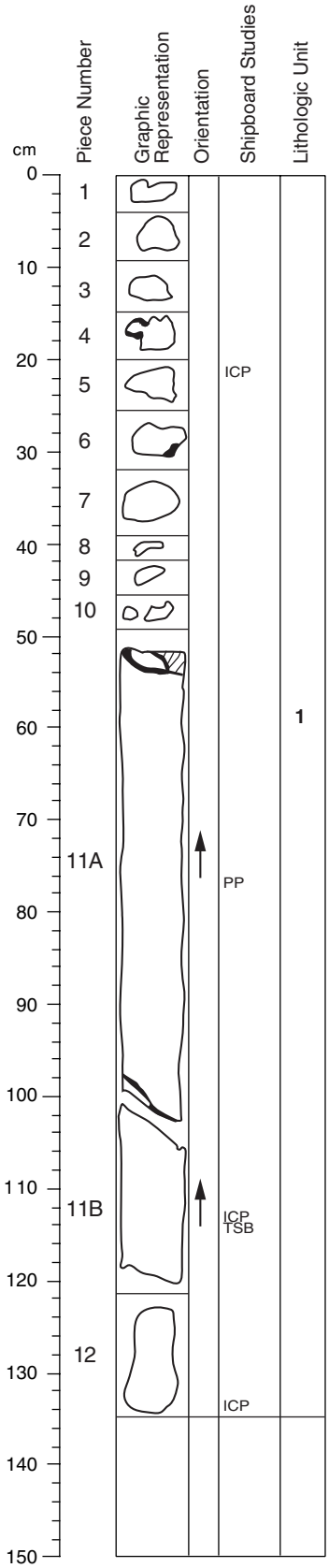
VISUAL CORE DESCRIPTION
SEDIMENTS/SEDIMENTARY ROCKS

195-1200A-15R-CC

Poorly-sorted, greenish gray sand-silt-clay-sized serpentine with granules and rare pebbles (serpentinized harzburgite clasts emplaced in drilling slurry.

0-8 cm: Slightly stiffer than Section195-1200A-15R-1. Clasts are less than 5 cm. Few subrounded ultramafic pebbles and few granules.

Core Photo



195-1200A-16R-1 (Section top: 137.6 mbsf)

ROCK NAME: Serpentinite (after harzburgite)

UNIT: 1

Pieces: 1-12

Interval: 0-135 cm

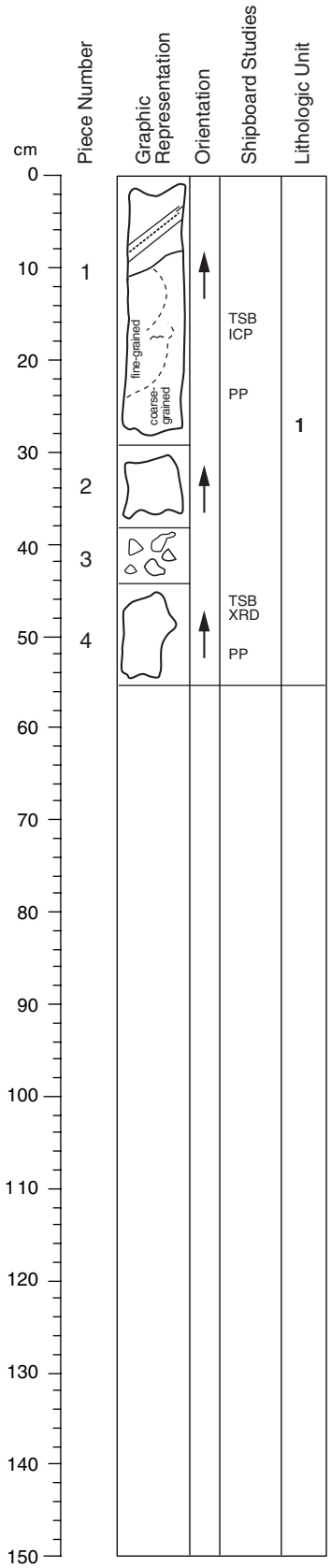
MINERALOGY:	% Mode	Grain Size (mm): Max	Min	Avg.	Shape/Habit
Olivine (original):					
Pyroxene (original):					
Serpentine:	99				Massive to bastitic and fibrous in veins.
Opaque Minerals:	tr				Subhedral chromite or magnesiochromite and fine, dusty magnetite.
Other:	tr				

COLOR: The color varies from dark gray (N 4/1) in Pieces 5 and 7 to dark greenish gray (5BG 4/1).

STRUCTURE: Several of the pieces are complexly sheared. Bastitic texture where pyroxene is replaced by serpentine is common.

VEINS/FRACTURES: Fine to very fine (chrysotile?) veinlets observed in all pieces.

Core Photo



195-1200A-16R-2 (Section top: 138.95 mbsf)

ROCK NAME: Serpentinite

UNIT: 1

Piece: 1, 2, 3 (five small clasts), and 4

Interval: 0- 55 cm

MINERALOGY:	% Mode	Grain Size (mm): Max	Min	Avg.	Shape/Habit
Olivine (original):					
Pyroxene (original):					
Serpentine:	99				Massive to bastitic and fibrous in veins.
Opaque Minerals:	tr				
Others:	tr				

COLOR: Bluish gray to dark bluish gray (5B 5/1 to 5B 4/1). Piece 4 is greenish gray (5GY 5/1).

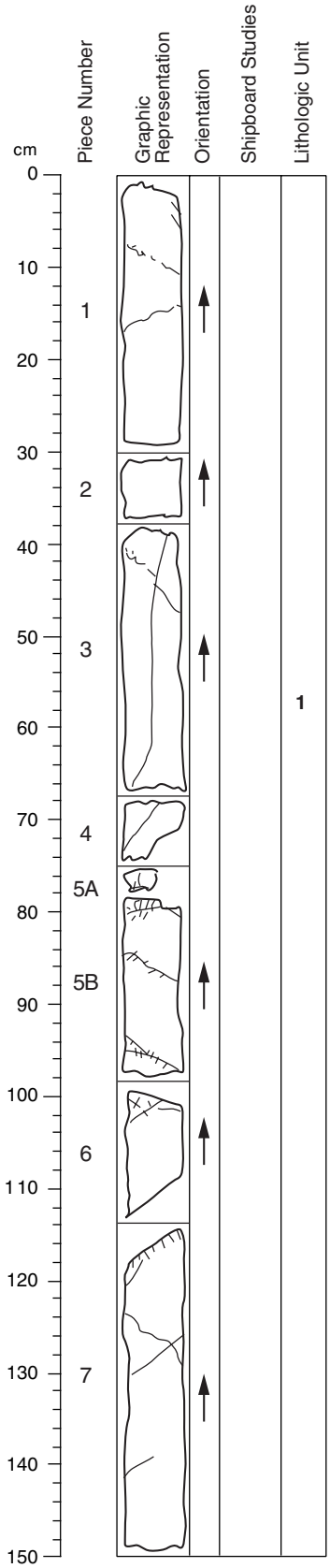
STRUCTURE: Bastitic texture where pyroxene is replaced by serpentine is common in places and lacking in others.

VEINS/FRACTURES: Fine chrysotile veinlets criss-cross rock in complex network.

COMMENTS: Piece 4 has the most altered, soft serpentinite recovered in Hole 1200A. It looks “soft and punky” compared to other dense rocks sampled from Hole 1200A.

Disaggregated structure

Core Photo



195-1200A-17G-1 (Ghost Core)

ROCK NAME: Serpentinite

UNIT: 1

Pieces: 1-7

Interval: 0-150 cm

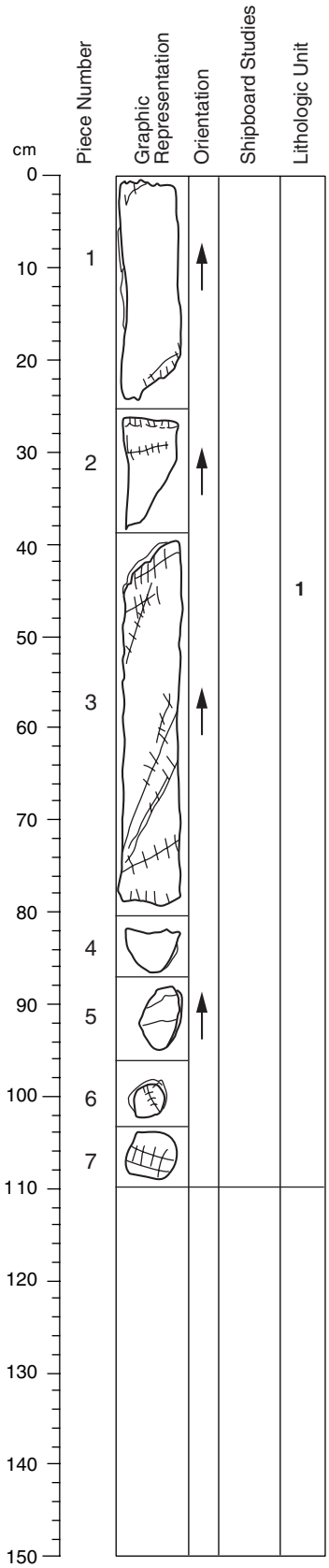
MINERALOGY:	% Mode	Grain Size (mm): Max	Min	Avg.	Shape/Habit
Olivine (original):					
Pyroxene (original):					
Serpentine:	99				Massive to bastitic and fibrous in veins.
Opaque Minerals:	tr				Subhedral chromite or magnesiochromite and fine, dusty magnetite.
Other:	tr				

COLOR: Very dark gray to dark bluish gray (N 3/ to 5B 4/1).

STRUCTURE: Most of the pieces show a bastitic texture where the pyroxene has been replaced by serpentinite.

VEINS/FRACTURES: Only few but variable veins of light blue to greenish material are observed.

Core Photo



195-1200A-17G-2 (Ghost Core)

ROCK NAME: Serpentinite

UNIT: 1

Pieces: 1-7

Interval: 0-109 cm

MINERALOGY:	% Mode	Grain Size (mm): Max	Min	Avg.	Shape/Habit
Olivine (original):					
Pyroxene (original):					
Serpentine:	99				Massive to bastitic and fibrous in veins.
Opaque Minerals:	tr				Subhedral chromite or magnesiochromite and fine, dusty magnetite.
Other:	tr				

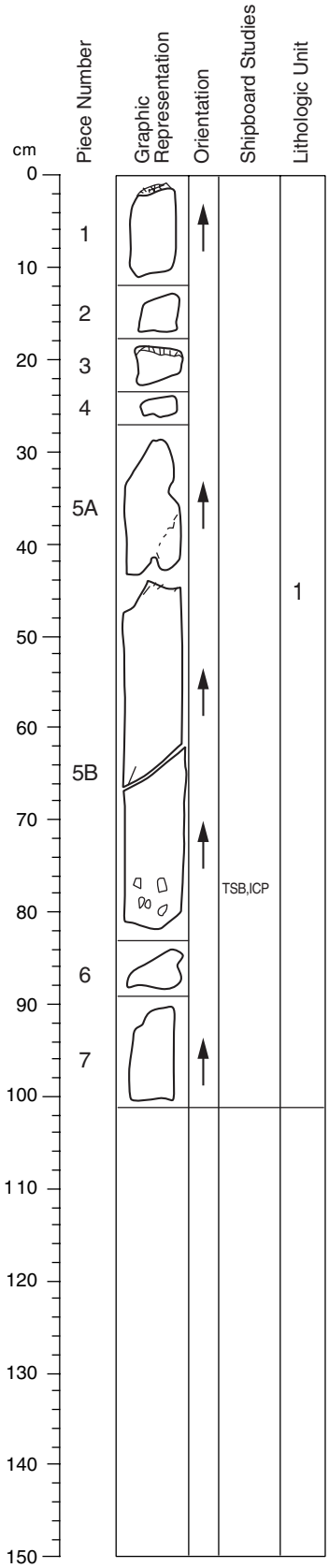
COLOR: Variable in color from very dark gray (N3/) to dark bluish gray (5B 4/1).

STRUCTURE: The pieces were originally intergranular, pyroxene grains have been replaced by bastitic serpentine.

VEINS/FRACTURES: Most veins are found at the end parts of the pieces. The bottom ends show an interesting cross section through the core with small fine veins cross-cutting in a network.

COMMENTS: Pieces 5 and 7 have an alteration aureole along the outer rim with a lighter yellowish green color.

Core Photo



195-1200B-1W-1 (Section top: 0.00 mbsf)

ROCK NAME: Serpentinite

UNIT: 1

Pieces: 1-7

Interval: 0-100 cm

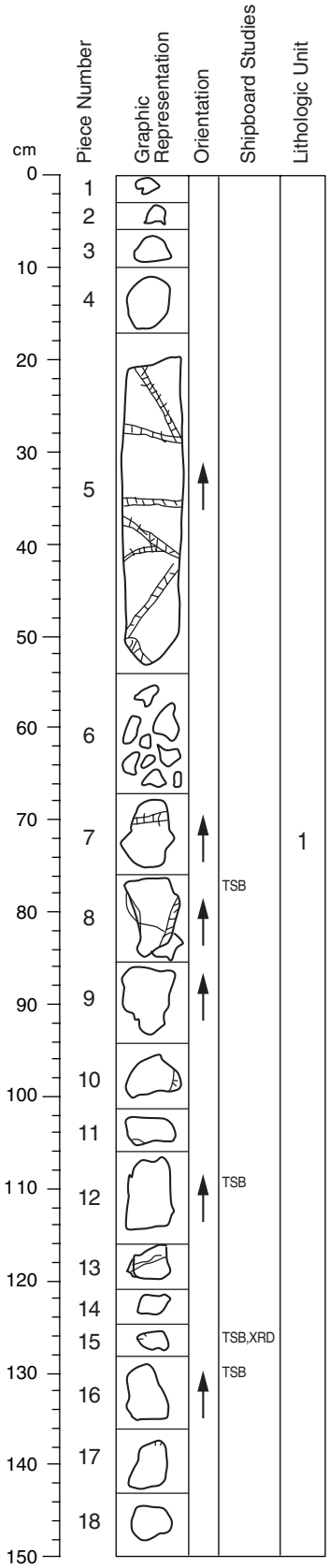
MINERALOGY:	% Mode	Grain Size (mm): Max	Min	Avg.	Shape/Habit
Olivine (original):					
Pyroxene (original):	0-30	0.9		0.3	Slightly rounded and subhedral.
Serpentine:	70-99				Massive to bastitic and fibrous in veins.
Opaque Minerals:	tr				Euhedral to subhedral chromite and fine, dusty magnetite.
Other:	tr				

COLOR: Dark bluish gray (5B 4/1)

STRUCTURE: Most pieces are fine-grained and dense. Piece 5a and b have bastitic texture where pyroxene is replaced by serpentine. Piece 5C has large (up to 10mm) light green grains (orthopyroxene?). Piece 5B contains large orthopyroxene grains (average 0.5-0.6 mm).

VEINS/FRACTURES: Fine white veins are seen in most pieces.

Core Photo



195-1200B-2W-1 (Section top: 30.70 mbsf)

ROCK NAME: Serpentinite

UNIT: 1

Pieces: 1-18 (compartment 6 contains 9 small fragments).

Interval: 0-150 cm

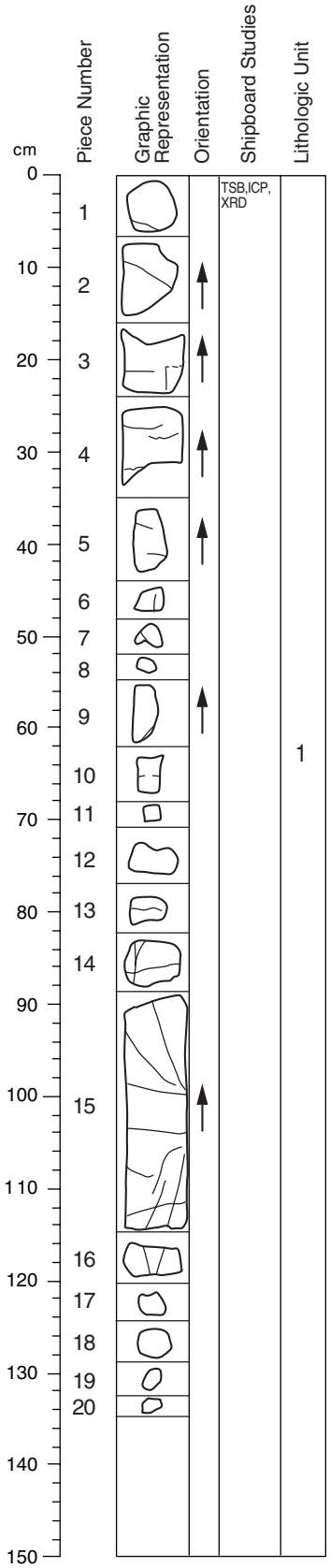
MINERALOGY:	% Mode	Grain Size (mm): Max	Min	Avg.	Shape/Habit
Olivine (original):					
Pyroxene (original):	0-30	0.9		0.3	Slightly rounded and subhedral.
Serpentine:	70-99				Massive to bastitic and fibrous in veins.
Opaque Minerals:	tr				Euhedral to subhedral chromite and fine, dusty magnetite.
Other:	tr				

COLOR: Bluish gray (5B 5/1).

STRUCTURE: Most of the pieces have a bastitic texture where pyroxene has been replaced by serpentine. Piece 15 is highly sheared, light green serpentine schist (with chlorite and talc?). Piece 16 is highly altered greenish to tan serpentine with good foliation defined by aligned greenish gray (5GY 6/1 to 5G 6/1) bastite. Pieces 17 and 18 are both sheared.

VEINS/FRACTURES: Central veins with fine subsidiary cross-cutting veins are seen in Piece 5 and 7. Most of the pieces have fine first generation dark veins and second generation white veins.

Core Photo



195-1200B-2W-2 (Section top: 32.20 mbsf)

ROCK NAME: Serpentinite

UNIT: 1

Pieces: 1-20

Interval: 0-135 cm

MINERALOGY:

	% Mode	Grain Size (mm): Max	Min	Avg.	Shape/Habit
Olivine (original):					
Pyroxene (original):	0-30	1.0		0.2	Subhedral.
Serpentine:	70-99				Massive to bastitic and fibrous in veins.
Opaque Minerals:	tr				Subhedral chromite and fine aggregates of dusty magnetite.

Other: tr

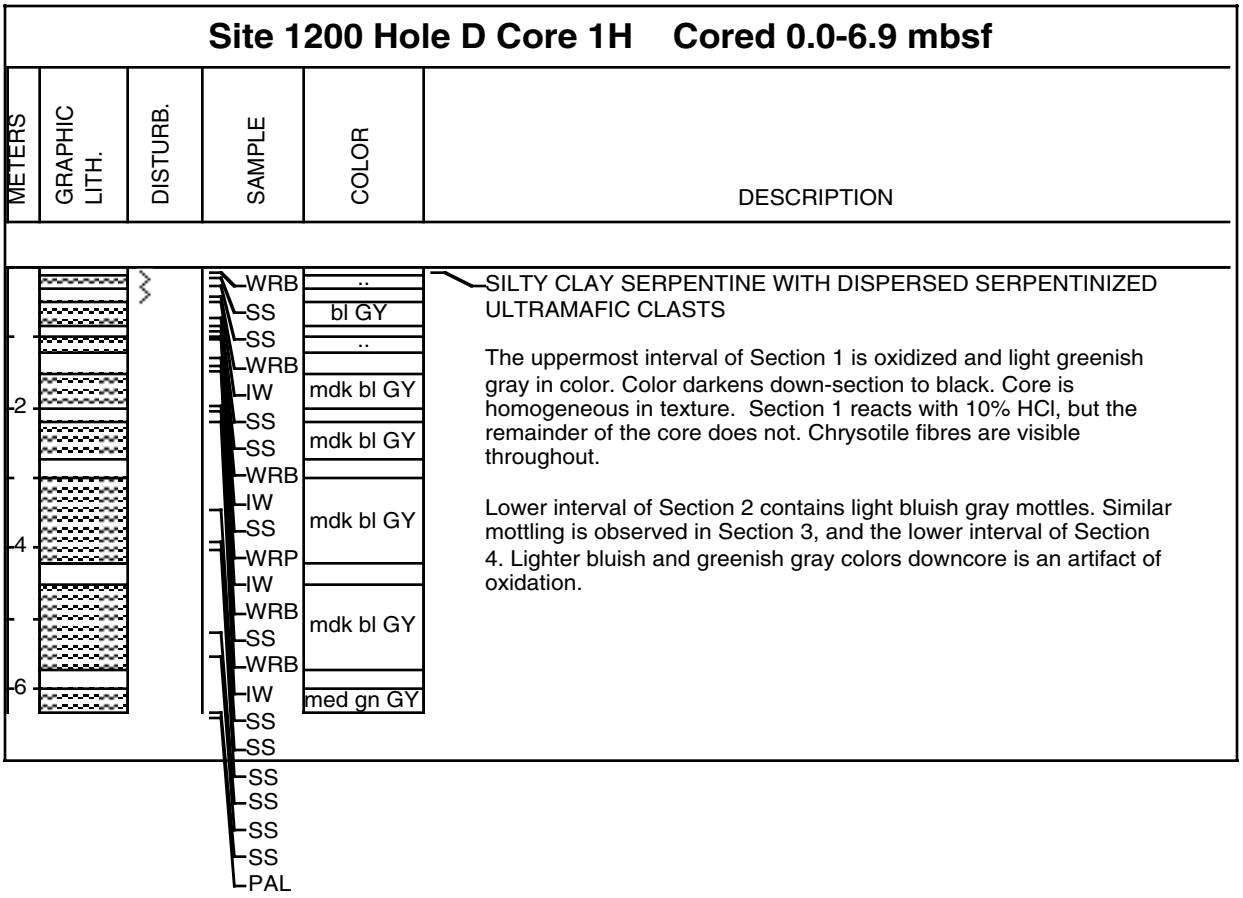
COLOR: From bluish gray to dark bluish gray (5B 5/1 to 5B 4/1).

STRUCTURE: Pieces 3, 12, and 15 to 18 have a bastitic texture where pyroxene has been replaced by serpentine. The remaining pieces are generally fine-grained and dense.Piece 4 and 12 contain large orthopyroxene grains.

VEINS/FRACTURES: Pieces 15 and 16 have a network of dark fractures. Only few fine veins are present in the remaining pieces.

COMMENTS: Piece 1 is lighter blue and has an alignment of minerals perpendicular to dark veinlets.

Core Photo


Site 1200 Hole D Core 1H Cored 0.0-6.9 mbsf
METERS
GRAPHIC LITH.
DISTURB.
SAMPLE
COLOR
DESCRIPTION
2
4
6
WRB
SS
SS
WRB
IW
SS
SS
WRB
IW
SS
WRP
IW
WRB
SS
WRB
IW
SS
SS
SS
SS
SS
SS
PAL
..
bl GY
..
mdk bl GY
mdk bl GY
mdk bl GY
mdk bl GY
med gn GY
SILTY CLAY SERPENTINE WITH DISPERSED SERPENTINIZED ULTRAMAFIC CLASTS
The uppermost interval of Section 1 is oxidized and light greenish gray in color. Color darkens down-section to black. Core is homogeneous in texture. Section 1 reacts with 10% HCl, but the remainder of the core does not. Chrysotile fibres are visible throughout.
Lower interval of Section 2 contains light bluish gray mottles. Similar mottling is observed in Section 3, and the lower interval of Section 4. Lighter bluish and greenish gray colors downcore is an artifact of oxidation.

Core Photo

Site 1200 Hole D Core 2H Cored 6.9-9.9 mbsf

METERS	GRAPHIC LITH.	DISTURB.	SAMPLE	COLOR	DESCRIPTION
8			SS SS PAL	med bl GY	SILTY CLAY SERPENTINE WITH DISPERSED SERPENTINIZED ULTRAMAFIC CLASTS Core is homogeneous in texture and does not react with 10% HCl. Chrysotile fibres are visible throughout. Section 1 contains dark bluish gray mottling. Similar mottling is observed in the upper interval of Section 2. Highly altered (greenish brown) and fragmented clasts are abundant in Sections 2 and 3.

Core Photo

Site 1200 Hole D Core 3H Cored 9.9-12.4 mbsf

METERS	GRAPHIC LITH.	DISTURB.	SAMPLE	COLOR	DESCRIPTION
12			SS SS SS PAL	med bl GY	SILTY CLAY SERPENTINE WITH DISPERSED SERPENTINIZED ULTRAMAFIC CLASTS Core is homogeneous in texture and does not react with 10% HCl. Chrysotile fibres are visible throughout. The lower interval of Section 1 contains dark bluish gray mottling and this continues into the upper interval of Section 2.

Core Photo

Site 1200 Hole D Core 4H Cored 12.4-12.7 mbsf

METERS	GRAPHIC LITH.	DISTURB.	SAMPLE	COLOR	DESCRIPTION
			PAL	..	SILTY CLAY SERPENTINE WITH DISPERSED SERPENTINIZED ULTRAMAFIC CLASTS Core is homogeneous in texture and does not react with 10% HCl. Chrysotile fibres are visible throughout. Core material is disturbed.

Core Photo

Site 1200 Hole D Core 5H Cored 13.7-14.3 mbsf

METERS	GRAPHIC LITH.	DISTURB.	SAMPLE	COLOR	DESCRIPTION
14			PAL		SILTY CLAY SERPENTINE WITH DISPERSED SERPENTINIZED ULTRAMAFIC CLASTS Core is homogeneous in texture and does not react with 10% HCl. Chrysotile fibres are visible throughout. Core material is disturbed.

Core Photo

Site 1200 Hole D Core 6H Cored 21.5-23.5 mbsf

METERS	GRAPHIC LITH.	DISTURB.	SAMPLE	COLOR	DESCRIPTION
22			SS	med bl GY	SILTY CLAY SERPENTINE WITH DISPERSED SERPENTINIZED ULTRAMAFIC CLASTS Core is homogeneous in texture and does not react with 10% HCl. Chrysotile fibres are visible throughout. The lighter greenish gray color downcore is an artifact of oxidation.
			SS PAL	med gn GY	

Core Photo

Site 1200 Hole D Core 7H Cored 23.5-25.0 mbsf

METERS	GRAPHIC LITH.	DISTURB.	SAMPLE	COLOR	DESCRIPTION
24			SS SS PAL	med gn GY	SILTY CLAY SERPENTINE WITH DISPERSED SERPENTINIZED ULTRAMAFIC CLASTS Core is homogeneous in texture and does not react with 10% HCl with the exception of a calcareous nodule at 88 cm. Chrysotile fibres are visible throughout. Highly altered (greenish brown) and fragmented clasts are abundant in Section 1.

Core Photo

Site 1200 Hole D Core 8H Cored 25.0-28.0 mbsf

METERS	GRAPHIC LITH.	DISTURB.	SAMPLE	COLOR	DESCRIPTION
26			SS	med gn GY	SILTY CLAY SERPENTINE WITH DISPERSED SERPENTINIZED ULTRAMAFIC CLASTS Core is homogeneous in texture and does not react with 10% HCl. Chrysotile fibres are visible throughout.
			SS	med gn GY	
28			PAL	..	

Core Photo

Site 1200 Hole D Core 9H Cored 28.0-29.5 mbsf

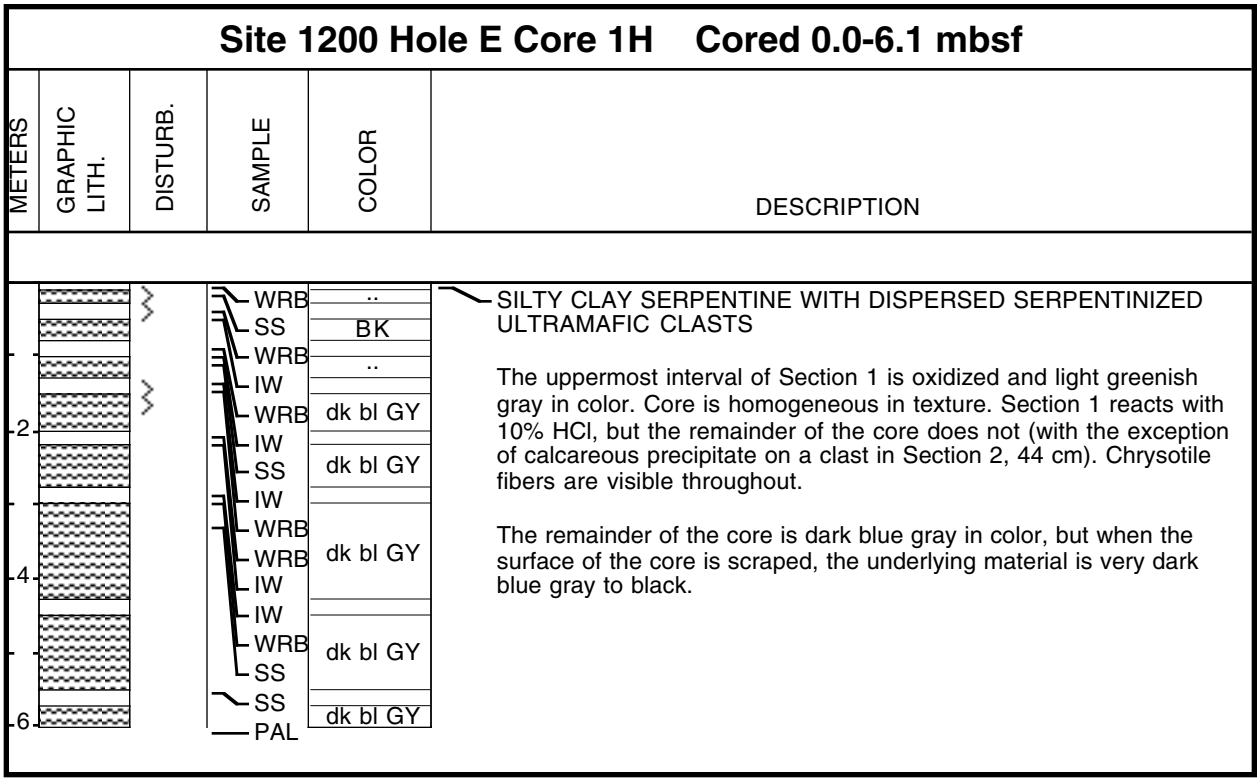
METERS	GRAPHIC LITH.	DISTURB.	SAMPLE	COLOR	DESCRIPTION
			SS PAL	med bl GY	SILTY CLAY SERPENTINE WITH DISPERSED SERPENTINIZED ULTRAMAFIC CLASTS Core is homogeneous in texture and does not react with 10% HCl. Chrysotile fibres are visible throughout. The top 35 cm of core is disturbed.

Core Photo

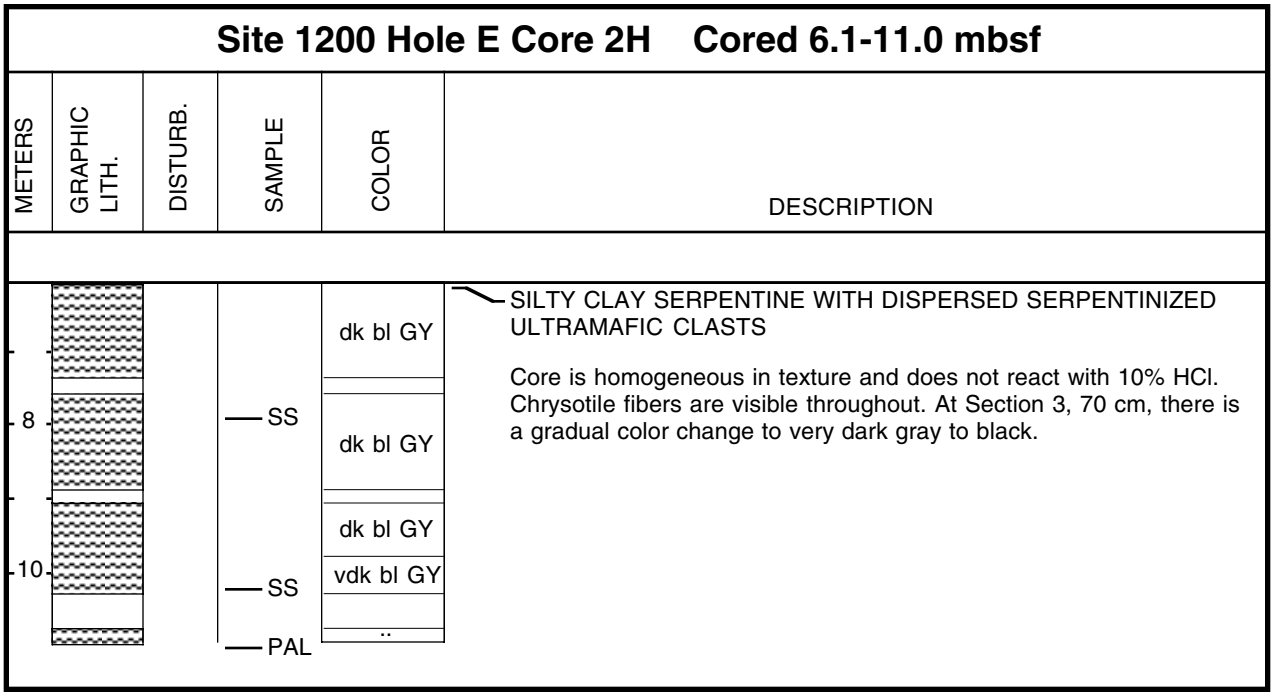
Site 1200 Hole D Core 10H Cored 34.8-35.4 mbsf

METERS	GRAPHIC LITH.	DISTURB.	SAMPLE	COLOR	DESCRIPTION
			SS PAL	med gn GY	SILTY CLAY SERPENTINE WITH DISPERSED SERPENTINIZED ULTRAMAFIC CLASTS Core is homogeneous in texture and does not react with 10% HCl. Chrysotile fibres are visible throughout.

Core Photo


Site 1200 Hole E Core 1H Cored 0.0-6.1 mbsf
METERS
GRAPHIC LITH.
DISTURB.
SAMPLE
COLOR
DESCRIPTION
2
4
6
WRB
SS
WRB
IW
WRB
IW
SS
IW
WRB
WRB
IW
IW
WRB
SS
SS
PAL
..
BK
..
dk bl GY
dk bl GY
dk bl GY
dk bl GY
SILTY CLAY SERPENTINE WITH DISPERSED SERPENTINIZED ULTRAMAFIC CLASTS
The uppermost interval of Section 1 is oxidized and light greenish gray in color. Core is homogeneous in texture. Section 1 reacts with 10% HCl, but the remainder of the core does not (with the exception of calcareous precipitate on a clast in Section 2, 44 cm). Chrysotile fibers are visible throughout.
The remainder of the core is dark blue gray in color, but when the surface of the core is scraped, the underlying material is very dark blue gray to black.

Core Photo


Site 1200 Hole E Core 2H Cored 6.1-11.0 mbsf
METERS
GRAPHIC LITH.
DISTURB.
SAMPLE
COLOR
DESCRIPTION
8
10
SS
SS
PAL
dk bl GY
dk bl GY
dk bl GY
vdk bl GY
SILTY CLAY SERPENTINE WITH DISPERSED SERPENTINIZED ULTRAMAFIC CLASTS
Core is homogeneous in texture and does not react with 10% HCl. Chrysotile fibers are visible throughout. At Section 3, 70 cm, there is a gradual color change to very dark gray to black.

Core Photo

Site 1200 Hole E Core 3H Cored 11.0-12.0 mbsf

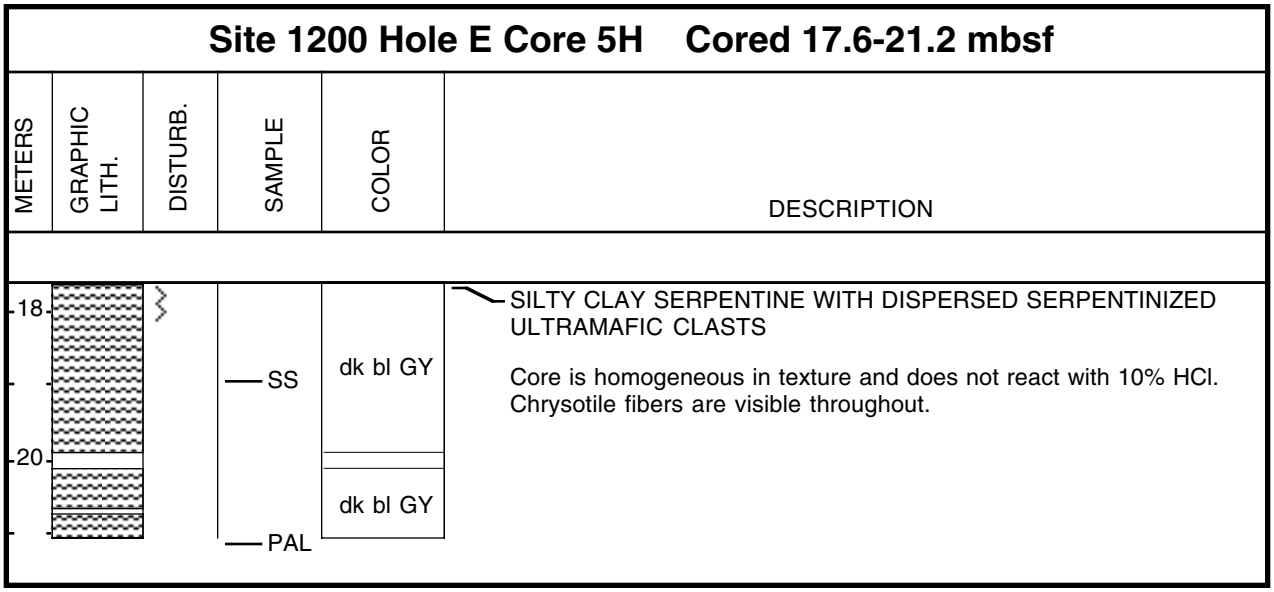
METERS	GRAPHIC LITH.	DISTURB.	SAMPLE	COLOR	DESCRIPTION
12			SS PAL	med bl GY med gn GY	SILTY CLAY SERPENTINE WITH DISPERSED SERPENTINIZED ULTRAMAFIC CLASTS Core is homogeneous in texture and reacts with 10% HCl. Chrysotile fibers are visible throughout. Highly calcareous intervals oxidize to light yellowish brown, resulting in a multi-colored core with bluish gray intervals punctuated with bands and mottles of light yellowish brown.

Core Photo

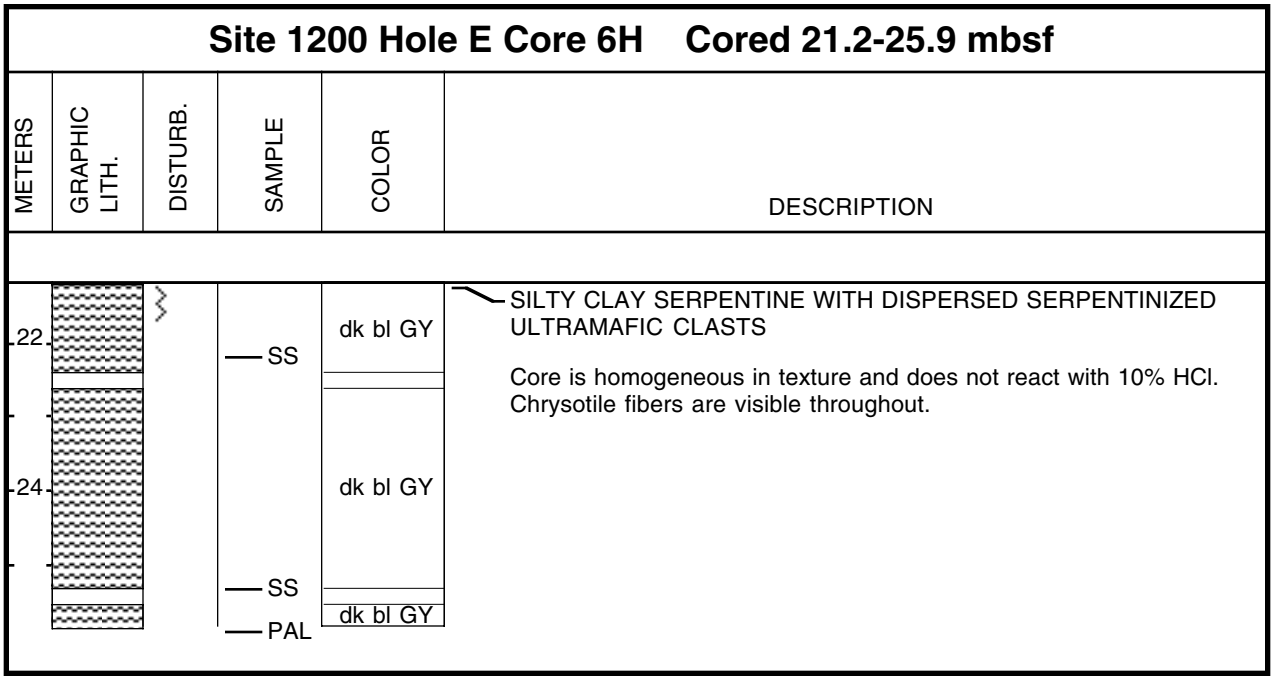
Site 1200 Hole E Core 4H Cored 12.0-17.6 mbsf

METERS	GRAPHIC LITH.	DISTURB.	SAMPLE	COLOR	DESCRIPTION
14			SS	med bl GY	SILTY CLAY SERPENTINE WITH DISPERSED SERPENTINIZED ULTRAMAFIC CLASTS
				lt ye BR	
				med bl GY	Core is homogeneous in texture. Chrysotile fibers are visible throughout. The uppermost interval of Section 1 (0-80 cm) does not react with 10% HCL, but the remainder of the core is calcareous. Yellowish brown intervals react more strongly to 10% HCl than bluish gray intervals. Highly calcareous intervals oxidize to light yellowish brown, resulting in a multi-colored core with bluish gray intervals punctuated with bands and mottles of light yellowish brown.
				lt ye BR	
16			SS	dk bl GY	When the surface of the core is scraped, the underlying material is very dark gray to black.
				dk bl GY	
			PAL		

Core Photo


Site 1200 Hole E Core 5H Cored 17.6-21.2 mbsf
METERS
GRAPHIC LITH.
DISTURB.
SAMPLE
COLOR
DESCRIPTION
18
20
SS
PAL
dk bl GY
dk bl GY
SILTY CLAY SERPENTINE WITH DISPERSED SERPENTINIZED ULTRAMAFIC CLASTS
Core is homogeneous in texture and does not react with 10% HCl. Chrysotile fibers are visible throughout.

Core Photo


Site 1200 Hole E Core 6H Cored 21.2-25.9 mbsf
METERS
GRAPHIC LITH.
DISTURB.
SAMPLE
COLOR
DESCRIPTION
22
24
SS
SS
PAL
dk bl GY
dk bl GY
dk bl GY
SILTY CLAY SERPENTINE WITH DISPERSED SERPENTINIZED ULTRAMAFIC CLASTS
Core is homogeneous in texture and does not react with 10% HCl. Chrysotile fibers are visible throughout.

Core Photo

Site 1200 Hole E Core 7H Cored 25.9-32.5 mbsf

METERS	GRAPHIC LITH.	DISTURB.	SAMPLE	COLOR	DESCRIPTION
28			SS	med bl GY	CLAST-POOR SERPENTINE DIAMICTON WITH CLAST-RICH INTERVALS Core is homogeneous in texture and does not react with 10% HCl. Chrysotile fibers are visible throughout. Starting with Core 1200E-7H, the remaining cores from Hole 1200E and all cores from Hole 1200F were cut with a rock saw. Prior to this, core was cut with the soft-sediment wireline. This explains the change in sediment classification to a term that is defined by higher clast abundance. The rock saw splits granules and small pebbles in half, rather than emplacing them in the sediment, making clast abundance appear higher. Section 3, 68-97 cm contains an interval of clast-rich serpentine diamicton.
				med bl GY	
30				med gn GY	
32			SS	med gn GY	
			PAL	med gn GY	

Core Photo

Site 1200 Hole E Core 8X Cored 32.5-40.9 mbsf

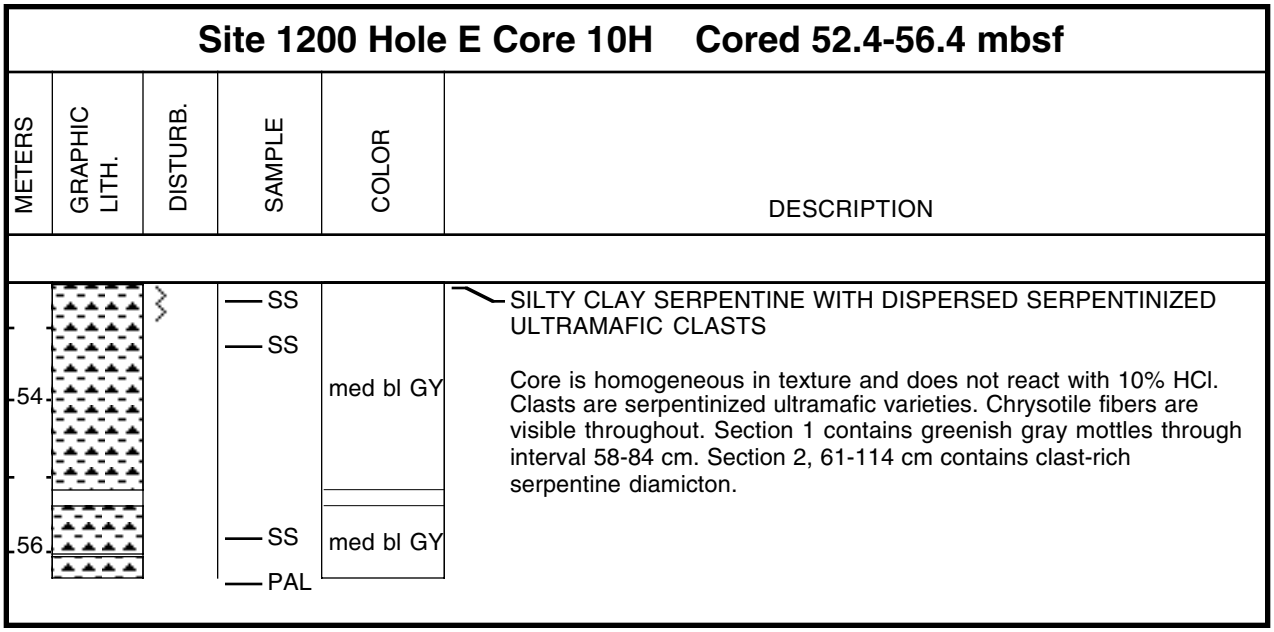
METERS	GRAPHIC LITH.	DISTURB.	SAMPLE	COLOR	DESCRIPTION
			PAL	med bl GY	SILTY CLAY SERPENTINE WITH DISPERSED SERPENTINIZED ULTRAMAFIC CLASTS Core is homogeneous in texture and does not react with 10% HCl. Chrysotile fibers are visible throughout. Core is highly disturbed, and consists of large clasts in slurry.

Core Photo

Site 1200 Hole E Core 9X Cored 40.9-50.4 mbsf

METERS	GRAPHIC LITH.	DISTURB.	SAMPLE	COLOR	DESCRIPTION
			PAL		SILTY CLAY SERPENTINE WITH DISPERSED SERPENTINIZED ULTRAMAFIC CLASTS Core is homogeneous in texture and does not react with 10% HCl. Chrysotile fibers are visible throughout. Core is disturbed.

Core Photo

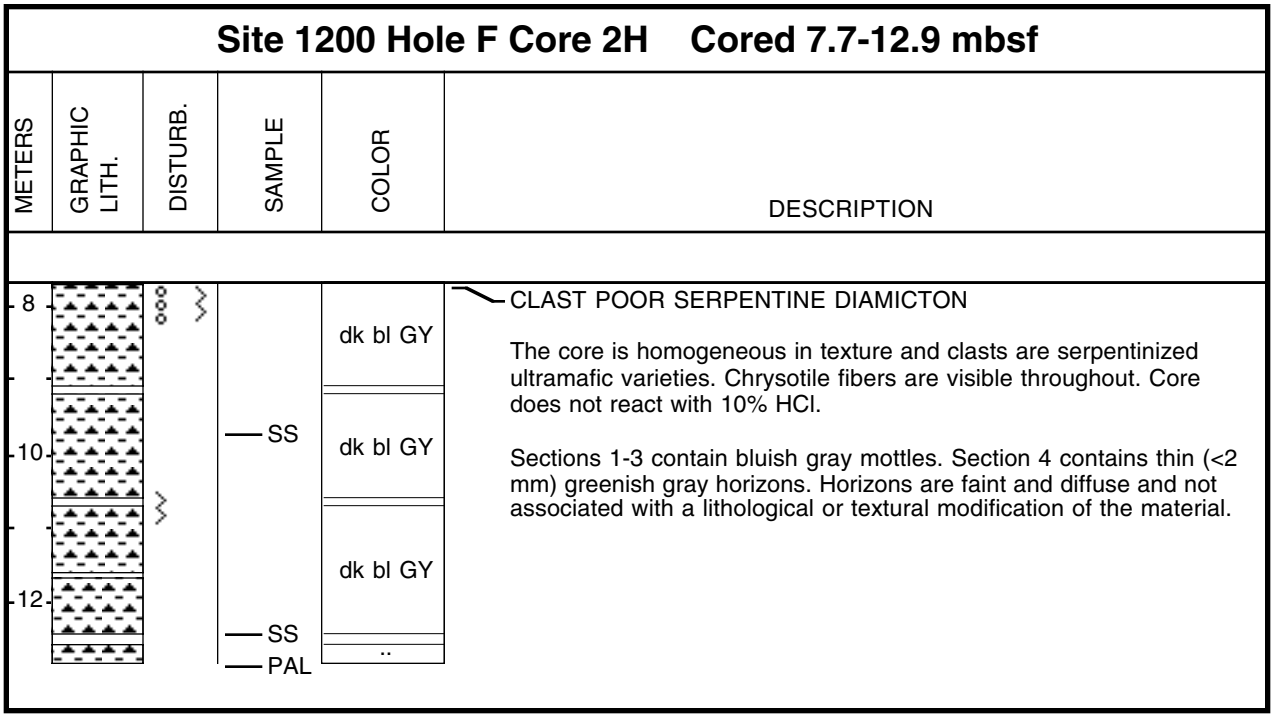

Site 1200 Hole E Core 10H Cored 52.4-56.4 mbsf
METERS
GRAPHIC LITH.
DISTURB.
SAMPLE
COLOR
DESCRIPTION
54
56
SS
SS
SS
PAL
med bl GY
med bl GY
SILTY CLAY SERPENTINE WITH DISPERSED SERPENTINIZED ULTRAMAFIC CLASTS
Core is homogeneous in texture and does not react with 10% HCl. Clasts are serpentinized ultramafic varieties. Chrysotile fibers are visible throughout. Section 1 contains greenish gray mottles through interval 58-84 cm. Section 2, 61-114 cm contains clast-rich serpentine diamicton.

Core Photo

Site 1200 Hole F Core 1H Cored 0.0-7.7 mbsf

METERS	GRAPHIC LITH.	DISTURB.	SAMPLE	COLOR	DESCRIPTION
2			IW	BK	CLAST POOR SERPENTINE DIAMICTON
			SS	BK	
			IW	BK	The core is homogeneous in texture and clasts are serpentinized ultramafic varieties. Chrysotile fibers are visible throughout. Section 1 reacts with 10% HCl, but the remainder of the core does not.
			IW	dk bl GY	
			IW	dk bl GY	The uppermost interval of Section 1 contains bluish gray mottles. Sections 2-CC are dark blue gray in color, but when the surface of the core is scraped, the underlying material is very dark blue gray to black.
4			IW		
			SS	dk bl GY	
				dk bl GY	Section 5 and the uppermost interval of the core catcher contain thin (<2 mm) greenish gray horizons. Horizons are faint and diffuse and not associated with a lithological or textural modification of the material.
6			SS	dk bl GY	
			PAL	dk bl GY	

Core Photo


Site 1200 Hole F Core 2H Cored 7.7-12.9 mbsf
METERS
GRAPHIC LITH.
DISTURB.
SAMPLE
COLOR
DESCRIPTION
8
10
12
SS
SS
PAL
dk bl GY
dk bl GY
dk bl GY
CLAST POOR SERPENTINE DIAMICTON
The core is homogeneous in texture and clasts are serpentinized ultramafic varieties. Chrysotile fibers are visible throughout. Core does not react with 10% HCl.
Sections 1-3 contain bluish gray mottles. Section 4 contains thin (<2 mm) greenish gray horizons. Horizons are faint and diffuse and not associated with a lithological or textural modification of the material.

Core Photo

Site 1200 Hole F Core 3H Cored 12.9-16.3 mbsf

METERS	GRAPHIC LITH.	DISTURB.	SAMPLE	COLOR	DESCRIPTION
14				dk bl GY	CLAST POOR SERPENTINE DIAMICTON The core is homogeneous in texture and clasts are serpentinized ultramafic varieties. Chrysotile fibers are visible throughout.Core does not react with 10% HCl. Upper interval of Section 1 is disturbed. The lowermost interval of Section 2 and the core catcher contain thin (<2 mm) greenish gray horizons. Horizons are faint and diffuse and not associated with a lithological or textural modification of the material.
			SS	dk bl GY	
16			PAL		

Sample	Depth (mbsf)	Lithology	Texture (vol %)			Component																
			Sand	Silt	Clay	Amphibole	Aragonite, large laths	Aragonite, reworked	Aragonite, tiny needles	Calcite	Chlorite	Chrysotile	Garnet	Mica	Serpentine, altered to opaque	Serpentine, dusky	Serpentine, fresh	Serpentine, with Lamellae	Spinel	Talc	Zeolite
Hole A																					
195-1200A-09-R-01, 054 cm	70.94	Mud	P	A	A							C			C	D	A	P			
195-1200A-09-R-01, 075 cm	71.15	Mud	P	A	A	R						C			C	D	A	P			
195-1200A-11-R-01, 000 cm	89.40	Rock piece 3, dark mica												D							
195-1200A-13-R-02, 005 cm	110.00	Sieved fine sand fraction	D									D									
195-1200A-15-R-01, 001 cm	127.91	Mud	P	A	A	R						C			P	D	C	P			
195-1200A-15-R-01, 016 cm	128.06	Mud	P	A	A	R						C			P	D	C	P			
195-1200A-15-R-CC, 000 cm	128.43	Fine sand fraction	D			R						C			P	D	C	P			
195-1200A-15-R-CC, 002 cm	128.45	Mud	P	A	A	R						C			P	D	C	P	R		

Sample	Depth (mbsf)	Lithology	Texture (vol %)			Component															
			Sand	Silt	Clay	Amphibole	Aragonite, large laths	Aragonite, reworked	Aragonite, tiny needles	Calcite	Chlorite	Chrysotile	Garnet	Mica	Serpentine, altered to opaque	Serpentine, dusky	Serpentine, fresh	Serpentine, with Lamellae	Spinel	Talc	Zeolite
Hole B																					
195-1200B-01-W-01, 000 cm		Fine sand fraction, fluff	D			R						D			P	C	C	P			
195-1200B-01-W-01, 000 cm		Fine sand fraction	D			R						C			P	D	C	P	R		

Sample	Depth (mbsf)	Lithology	Texture (vol %)			Component																
			Sand	Silt	Clay	Amphibole	Aragonite, large laths	Aragonite, reworked	Aragonite, tiny needles	Calcite	Chlorite	Chrysotile	Garnet	Mica	Serpentine, altered to opaque	Serpentine, dusky	Serpentine, fresh	Serpentine, with Lamellae	Spinel	Talc	Zeolite
Hole D																					
195-1200D-01-H-01, 011 cm	0.11	Oxidized Mud	P	A	A	R			C			C			P	D	C	P	R		
195-1200D-01-H-01, 020 cm	0.20	Light bluish gray mud	P	A	A				P			C			P	D	C	P	R		
195-1200D-01-H-01, 069 cm	0.69	Chrysotile fibers from clast	D									D									
195-1200D-01-H-01, 078 cm	0.78	Bluish gray mud	P	A	A							P			P	D	P	P			
195-1200D-01-H-01, 100 cm	1.00	Black mud	P	A	A		A					P			C	D	P	P	R		
195-1200D-01-H-02, 040 cm	1.90	Dark bluish gray mud	P	A	A							P			D	C	P	P	R		
195-1200D-01-H-03, 040 cm	3.40	Bluish gray mud	P	A	A							P			D	C	P	P			
195-1200D-01-H-03, 087 cm	3.87	Precipitation on clast	P	D	P					D											
195-1200D-01-H-03, 099 cm	3.99	Serpentine streak	D															D			
195-1200D-01-H-04, 065 cm	5.15	Bluish gray mud	P	A	A							P			P	D	C	P			
195-1200D-01-H-04, 099 cm	5.49	Altered clast	C	A	A										P	D	P				
195-1200D-01-H-CC, 030 cm	6.70	Serpentine streak	D															D			
195-1200D-02-H-01, 080 cm	7.70	Bluish gray mud	P	A	A	R						P				D	C	P			
195-1200D-02-H-02, 071 cm	9.11	Altered clast	C	D	A										D	C	P				
195-1200D-03-H-01, 055 cm	10.45	Altered clast, light green	C	D	A							C				D	P				
195-1200D-03-H-01, 060 cm	10.50	Altered clast, dark green	C	D	A							P			A	D	P				
195-1200D-03-H-01, 110 cm	11.00	Bluish gray mud	P	A	A							P	R			D	P	P			
195-1200D-04-H-01, 010 cm	12.50	Bluish gray mud	P	A	A											D	C	P	R		
195-1200D-06-H-01, 010 cm	21.60	Bluish gray mud	P	A	A	R					R	P				D	P	P	R		
195-1200D-06-H-02, 025 cm	23.12	Bluish gray mud	P	A	A											D	C	P			
195-1200D-06-H-CC, 000 cm	23.19	Fine sand fraction, fluff	D									D				P	C				
195-1200D-06-H-CC, 000 cm	23.19	Fine sand fraction	D			R		R			R				P	D	A	C			
195-1200D-07-H-01, 060 cm	24.10	Bluish gray mud	P	A	A	R						P			P	D	C	P			
195-1200D-07-H-01, 088 cm	24.38	Altered clast	C	D	A										D	C	P				
195-1200D-07-H-CC, 000 cm	24.80	Fine sand fraction	D									C			P	A	D	C			
195-1200D-08-H-01, 020 cm	25.20	Bluish gray mud	P	A	A	R		R			R				P	D	C	P			
195-1200D-08-H-02, 050 cm	27.00	Bluish gray mud	P	A	A	R					P	P			P	D	C	P			
195-1200D-08-H-CC, 000 cm	27.67	Fine sand fraction	D			R		R				P			C	D	A	P			
195-1200D-09-H-01, 050 cm	28.50	Bluish gray mud	P	A	A	R						P			P	D	C	P			
195-1200D-09-H-CC, 000 cm	29.10	Fine sand fraction	D			R					R	P			C	D	A	P			
195-1200D-10-H-01, 040 cm	35.20	Bluish gray mud	P	A	A							P			P	D	C	P			

Sample	Depth (mbsf)	Lithology	Texture (vol %)			Component																
			Sand	Silt	Clay	Amphibole	Aragonite, large laths	Aragonite, reworked	Aragonite, tiny needles	Calcite	Chlorite	Chrysotile	Garnet	Mica	Serpentine, altered to opaque	Serpentine, dusky	Serpentine, fresh	Serpentine, with Lamellae	Spinel	Talc	Zeolite
Hole E																					
195-1200E-01-H-01, 015 cm	0.15	Oxidized mud	P	A	A		C		A						P	D	C	P			
195-1200E-01-H-01, 110 cm	1.10	Black mud	P	A	A	R	D								A	C		P			
195-1200E-01-H-02, 116 cm	2.66	Micro nodule																			D
195-1200E-01-H-03, 030 cm	3.30	Black mud	P	A	A	R						P			A	D	P	P			
195-1200E-01-H-04, 100 cm	5.50	Black mud	P	A	A	R						P			A	D	P	P			
195-1200E-02-H-02, 030 cm	7.90	Black mud	P	A	A	R						P			A	D	P	P			
195-1200E-02-H-03, 120 cm	10.30	White soft clast																		D	
195-1200E-02-H-03, 110 cm	10.20	Black mud	P	A	A	R					R	P			A	D	P	P			
195-1200E-03-H-01, 075 cm	11.75	Contorted greenish mud	P	A	A	R	C		A			P			P	C	C	P	R		
195-1200E-04-H-01, 060 cm	12.60	Black mud	P	A	A	R		R				P			A	D	P	P	R		
195-1200E-04-H-03, 070 cm	15.70	Black mud	P	A	A	R		R				P			A	D	P	P			
195-1200E-05-H-01, 130 cm	18.90	Dark bluish mud	P	A	A	R						C			A	D	P	P	R		
195-1200E-05-H-CC, 000 cm	20.72	Fine sand fraction	D			R		R				P			C	D	C	P			
195-1200E-06-H-01, 100 cm	22.20	Dark bluish mud	P	A	A							P			C	D	P	P			
195-1200E-06-H-03, 115 cm	25.29	Dark bluish mud	P	A	A							P			A	D	P	P	R		
195-1200E-06-H-CC, 000 cm	25.53	Fine sand fraction	D			R						P			C	D	C	P			
195-1200E-06-H-CC, 000 cm	25.53	Fine sand fraction, fluff	D									D			C	A	A	P			
195-1200E-07-H-02, 100 cm	28.40	Bluish gray mud	P	A	A							P			C	D	P	P			
195-1200E-07-H-05, 020 cm	32.10	Bluish gray mud	P	A	A							P			C	D	P	P			
195-1200E-07-H-CC, 000 cm	32.32	Fine sand fraction	D			R						C			P	D	C	P			
195-1200E-10-H-01, 020 cm	52.60	Bluish gray mud	P	A	A							P			C	D	P	P			
195-1200E-10-H-01, 082 cm	53.22	Altered clast, reddish	P	A	A										D			P			
195-1200E-10-H-03, 040 cm	55.80	Bluish gray mud	P	A	A			R			R	P			C	D	P	P			

Sample	Depth (mbsf)	Lithology	Texture (vol %)			Component																
			Sand	Silt	Clay	Amphibole	Aragonite, large laths	Aragonite, reworked	Aragonite, tiny needles	Calcite	Chlorite	Chrysotile	Garnet	Mica	Serpentine, altered to opaque	Serpentine, dusky	Serpentine, fresh	Serpentine, with Lamellae	Spinel	Talc	Zeolite
Hole F																					
195-1200F-01-H-01, 040 cm	0.40	Black mud	P	A	A	R	D								A	C	P	P			
195-1200F-01-H-03, 040 cm	3.40	Black mud	P	A	A	R						P			A	A	P	P			
195-1200F-01-H-05, 060 cm	6.60	Black mud	P	A	A							P			A	A	P	P			
195-1200F-01-H-CC, 000 cm	7.20	Fine sand fraction	D			P						C			C	D	C	P			
195-1200F-02-H-02, 050 cm	9.70	Black mud	P	A	A	R						P			A	A	P	P	R		
195-1200F-02-H-04, 070 cm	12.40	Black mud	P	A	A							P			A	A	P	P			

TS: 1 195-1200A-2R-1, 0-3 cm (Piece 1) **Unit 1** **OBSERVER: IS, MD, MK**

ROCK NAME: **Highly-altered serpentinite (after dunite)**

GRAIN SIZE: **Fine-grained**

TEXTURE: **Mesh, hourglass**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	SIZE (mm) max.	SIZE (mm) av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
Olivine	40	95	<0.04	0.12	0.04	Mg-rich	Subhedral, anhedral	
Orthopyroxene								
Clinopyroxene	<1	1		0.4			Subhedral	
Amphibole								
OPAQUE MINERALS								
Magnetite	1				<0.04		Dust-like	After Cr-spinel
Cr-spinel	3	4	0.24	2	0.8		Euhedral	
Sulfide								

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	SIZE (mm) max.	SIZE (mm) av.	REPLACING / FILLING	COMMENTS
Antigorite						
Lizardite						
Chrysotile						
Serpentine	45				Olivine, vein filling	
Brucite	10				Olivine	
Chlorite	<1				Vein filling	
Talc						
Carbonate						
Amphibole						
Clay minerals						

VEINS	LOCATION	SIZE (mm) min.	SIZE (mm) max.	SIZE (mm) av.	FILLING / MORPHOLOGY	COMMENTS
		0.08	0.8	0.4	Serpentine, chlorite	

COMMENTS:

TS: 2 195-1200A-3R-1, 10-12 cm (Piece 1A) **Unit 1** **OBSERVER: IS, MD, MK**

ROCK NAME: **Very highly altered serpentinite (after harzburgite)**

GRAIN SIZE: **Fine-grained**

TEXTURE: **Mesh**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	SIZE (mm) max.	SIZE (mm) av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
Olivine	5	85	<0.04	0.2	0.1	Mg-rich	Anhedral	
Orthopyroxene		12						
Clinopyroxene								
Amphibole								
OPAQUE MINERALS								
Magnetite	1				<0.04		Dust-like	
Cr-spinel	3	3	0.06	2	1		Subhedral, sometimes euhedral	
Sulfide								

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	SIZE (mm) max.	SIZE (mm) av.		REPLACING / FILLING	COMMENTS
Antigorite							
Lizardite							
Chrysotile							
Serpentine	78			0.3		Olivine, orthopyroxene	
Brucite	12			0.08		Orthopyroxene/in veins	
Chlorite							
Talc							
Carbonate							
Amphibole	<1	0.01	0.4	0.05	Anthophyllite?	Orthopyroxene	
Clay minerals							

VEINS	LOCATION	SIZE (mm) min.	SIZE (mm) max.	SIZE (mm) av.	FILLING / MORPHOLOGY	COMMENTS
		0.08	1.2	0.2	Serpentine, magnetite, brucite	Different kinds.

COMMENTS:

TS: 3 195-1200A-3R-1, 29-31 cm (Piece 1A) **Unit 1** **OBSERVER: IS, MD, MK**
ROCK NAME: **Completely altered serpentinite (after dunite)**
GRAIN SIZE: **Fine-grained**
TEXTURE: **Mesh**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	max.	av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
Olivine		90						
Orthopyroxene		8						
Clinopyroxene								
Amphibole								
OPAQUE MINERALS								
Magnetite	4				0.1		Euhedral, sometimes dust-like	Vein filling, after orthopyroxene
Cr-spinel	1	2	0.3	0.8	0.4		Euhedral to subhedral	
Sulfide								

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	max.	av.		REPLACING / FILLING	COMMENTS
Antigorite							
Lizardite							
Chrysotile							
Serpentine	76			0.2		Olivine, orthopyroxene	Vein filling, fibrous
Brucite	15			0.1		Olivine, orthopyroxene	
Chlorite	2			0.2			Scattered, vein filling
Talc							
Carbonate							
Amphibole	2	<0.04	0.1	0.06	Anthophyllite?		Scattered, vein filling
Clay minerals							

VEINS	LOCATION	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS
		0.05	1.2	0.02	Serpentine, magnetite, chlorite	At least three vein generations

COMMENTS:

TS: 4 195-1200A-3R-1, 38-42 cm (Piece 1B) **Unit 1** **OBSERVER: IS, MD, MK**

ROCK NAME: **Very highly altered serpentinite (after harzburgite)**

GRAIN SIZE: **Fine- to medium-grained**

TEXTURE: **Mesh**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	max.	av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
Olivine	5	85	<0.04	0.3	0.12	Mg-rich	Anhedral	
Orthopyroxene	5	11	0.2	4	1	Mg-rich	Anhedral	
Clinopyroxene	2	3			0.4	Mg-rich	Anhedral	
Amphibole								
OPAQUE MINERALS								
Magnetite	<1				<0.04		Dust-like	Vein-filling
Cr-spinel	<1	1	0.08	0.8	0.4		Euhedral to anhedral	
Sulfide								

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	max.	av.	REPLACING / FILLING	COMMENTS
Antigorite						
Lizardite						
Chrysotile						
Serpentine	72			0.2	Olivine and orthopyroxene	
Brucite	15			0.05	Olivine and orthopyroxene	
Chlorite						
Talc						
Carbonate						
Amphibole	<1			0.05	Anthophyllite?	Scattered
Clay minerals						

VEINS	LOCATION	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS
		0.04	0.2	0.08	Fine, filled with fibrous serpentine	

COMMENTS:

TS: 5 195-1200A-3R-1, 81-84 cm (Piece 2) **Unit 1** **OBSERVER: IS, MD, MK**

ROCK NAME: **Highly altered serpentinite (after harzburgite)**

GRAIN SIZE: **Fine- to medium-grained**

TEXTURE: **Mesh, bastite**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	max.	av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
Olivine	5	57			0.08	Mg-rich	Subhedral prismatic	
Orthopyroxene	30	35	0.02	2.5	2	Mg-rich	Subhedral platy	Exsolution lamellae of clinopyroxene.
Clinopyroxene	3	5	<0.4	1.2		Mg-rich	Anhedral	
Amphibole								
OPAQUE MINERALS								
Magnetite	<1						Dust-like	After serpentinization of olivine and orthopyroxene.
Cr-spinel	2	3	0.12	1.2	0.8		Euhedral to subhedral	
Sulfide								

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	max.	av.		REPLACING / FILLING	COMMENTS
Antigorite							
Lizardite							
Chrysotile							
Serpentine	48			0.2		Olivine, orthopyroxene, vein-filling	
Brucite	10			0.2		Orthopyroxene	
Chlorite							
Talc							
Carbonate							
Amphibole	1				Anthophyllite?	Rimming opx	
Clay minerals							

VEINS	LOCATION	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS
						Very thin

COMMENTS:

TS: 6 195-1200A-6R-1, 31-35 cm (Piece 2) **Unit 1** **OBSERVER: IS, MD, MK**

ROCK NAME: **Highly altered serpentinite (after harzburgite)**
GRAIN SIZE: **Fine- to medium-grained**
TEXTURE: **Mesh, bastite**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	max.	av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
Olivine	5	80	<0.1	0.4	0.2	Mg-rich	Anhedral, rounded	
Orthopyroxene	10	15	0.2	4	1	Mg-rich	Subhedral, prismatic	Exsolution lamellae of clinopyroxene.
Clinopyroxene	2	3				Mg-rich	Subhedral	In proximity to orthopyroxene grains.
Amphibole								
OPAQUE MINERALS								
Magnetite	1		<0.1					
Cr-spinel	2	2		0.5	0.1		Euhedral	
Sulfide								

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	max.	av.	REPLACING / FILLING	COMMENTS
Antigorite						
Lizardite						
Chrysotile						
Serpentine	58				Olivine and orthopyroxene	
Brucite	15				Olivine and orthopyroxene	
Chlorite	5				Mafic phases: in veins	Close to veins with serpentine fill.
Talc						
Carbonate						
Amphibole	2				Orthopyroxene	Strongly pleochroic from light yellow to green to pale blue.
Clay minerals						

VEINS	LOCATION	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS

COMMENTS:

TS: 7 195-1200A-6R-2, 39-41 cm (Piece 1B) **Unit 1** **OBSERVER: IS, MD, MK**

ROCK NAME: **Very highly altered serpentinite (after harzburgite)**
GRAIN SIZE: **Fine-grained**
TEXTURE: **Mesh, hourglass, bastite**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	max.	av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
Olivine	2	80	<0.1	0.2	0.1	Mg-rich	Anhedral	Small grains (hourglass texture) with halos of fibrous serpentine.
Orthopyroxene	15	19	0.2	3	1	Mg-rich	Prismatic, sometimes poikilitic	Tiny exsolution lamellae of clinopyroxene; encloses rounded serpentinized relicts of olivine.
Clinopyroxene								
Amphibole								
OPAQUE MINERALS								
Magnetite	1						Dust-like aggregates; in veins	
Cr-spinel	1	1	0.04	0.8	0.2		Euhedral (small grains) to anhedral (large grains)	
Sulfide								

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	max.	av.	REPLACING / FILLING	COMMENTS
Antigorite						
Lizardite						
Chrysotile						
Serpentine	77				Olivine and orthopyroxene	
Brucite	3				Orthopyroxene	Replacement sometimes incomplete.
Chlorite	1				Vein filling; after orthopyroxene?	
Talc						
Carbonate						
Amphibole						
Clay minerals						

VEINS	LOCATION	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS
		0.04	0.8	0.4	Magnetite and serpentine	Yellowish-brown in color.

COMMENTS:

TS: 8 195-1200A-7R-2, 27-29cm (Piece 1A) **Unit 1** **OBSERVER: IS, MD, MK**

ROCK NAME: **Highly altered serpentinite (after harzburgite)**
GRAIN SIZE: **Fine- to medium-grained**
TEXTURE: **Mesh, bastite**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	max.	av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
Olivine	20	79	<0.1	0.2	0.1	Mg-rich	Euhedral prismatic	Sometimes kink-banded.
Orthopyroxene	15	20	0.04	2	1	Mg-rich	Subhedral to anhedral, platy, sometimes embayed	Often deformed.
Clinopyroxene	<1		<0.04	0.3	0.2			
Amphibole								
OPAQUE MINERALS								
Magnetite	<<1						Dust-like	Close to, or in veins.
Cr-spinel	<1	1	0.05	0.8	0.4		Anhedral, embayed, sometimes euhedral	
Sulfide								

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	max.	av.	REPLACING / FILLING	COMMENTS
Antigorite						
Lizardite						
Chrysotile						
Serpentine	59				Olivine and orthopyroxene	
Brucite	5				Orthopyroxene	
Chlorite						
Talc						
Carbonate						
Amphibole						
Clay minerals						

VEINS	LOCATION	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS
		0.04	5		Serpentine and magnetite	

COMMENTS: Rock is crossed by a large serpentine vein. This vein is perpendicular to later veinlets of chrysotile (?). Surprisingly, areas proximal to these veins contain abundant fresh olivine and orthopyroxene.

TS: 9 195-1200A-7R-2, 69-71 cm (Piece 1C) **Unit 1** **OBSERVER: IS, MD, MK**
ROCK NAME: **Moderately altered serpentinite (after harzburgite)**
GRAIN SIZE: **Medium- to coarse-grained**
TEXTURE: **Mesh**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	max.	av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
Olivine	35	85	<0.1	0.2	0.1	Mg-rich	Subhedral to anhedral	Sometimes strained.
Orthopyroxene	25	14	0.4	4	2	Mg-rich	Subhedral to anhedral	Highly strained.
Clinopyroxene	1		0.1	0.3	0.2	Mg-rich	Subhedral	
Amphibole								
OPAQUE MINERALS								
Magnetite	<1						Dust-like	
Cr-spinel	1	1	<0.1	0.4	0.1		Euhedral to embayed	
Sulfide								

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	max.	av.		REPLACING / FILLING	COMMENTS
Antigorite							
Lizardite							
Chrysotile							
Serpentine	30					Olivine and orthopyroxene	
Brucite	7					Olivine and orthopyroxene	
Chlorite							
Talc							
Carbonate							
Amphibole	<1				Anthophyllite?	In veins	
Clay minerals							

VEINS	LOCATION	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS
		<0.1	2	0.4	Serpentine, amphibole	

COMMENTS:

TS: 10 195-1200A-10R-1, 12-14 cm (Piece 3) **Unit 1** **OBSERVER: IS, MD, MK**

ROCK NAME: **Highly altered serpentinite (after orthopyroxene-rich harzburgite)**

GRAIN SIZE: **Coarse-grained**

TEXTURE: **Mesh, hourglass, granoblastic**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	max.	av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
Olivine	1	49	<0.04	0.2	0.1	Mg-rich	Anhedral	One large rounded granoblast.
Orthopyroxene	35	50	0.1	3	1.5	Mg-rich	Embayed	Very large.
Clinopyroxene								
Amphibole								
OPAQUE MINERALS								
Magnetite	1						Dust-like	
Cr-spinel	2	1	<0.1	0.6	0.2		Subhedral	
Sulfide								

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	max.	av.	REPLACING / FILLING	COMMENTS
Antigorite						
Lizardite						
Chrysotile						
Serpentine	50			0.3	Orthopyroxene, olivine	
Brucite	10			0.1	Orthopyroxene, olivine	
Chlorite						
Talc						
Carbonate						
Amphibole						
Clay minerals						

VEINS	LOCATION	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS
		<0.05	0.2	0.1		

COMMENTS:

TS: 11 DOES NOT EXIST

TS: 12 195-1200A-11R-1, 45-47 cm (Piece 8) **Unit 1** **OBSERVER: IS, MD, MK**

ROCK NAME: **Completely altered serpentinite (after harzburgite)**

GRAIN SIZE: **Fine- to medium-grained**

TEXTURE: **Mesh, bastite**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	SIZE (mm) max.	SIZE (mm) av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
Olivine		60						Some enclosed poikilitically in orthopyroxene.
Orthopyroxene	2	39	0.1	4	2		Anhedral	Pseudomorphs of amphibole and chlorite.
Clinopyroxene								
Amphibole								
OPAQUE MINERALS								
Magnetite	1						After Cr-spinel	
Cr-spinel		1						
Sulfide								

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	SIZE (mm) max.	SIZE (mm) av.	REPLACING / FILLING	COMMENTS
Antigorite						
Lizardite						
Chrysotile						
Serpentine	62				Olivine, orthopyroxene	
Brucite	15				Olivine, orthopyroxene	
Chlorite	15				Orthopyroxene, vein filling	
Talc						
Carbonate						
Amphibole	5				Orthopyroxene	
Clay minerals						

VEINS	LOCATION	SIZE (mm) min.	SIZE (mm) max.	SIZE (mm) av.	FILLING / MORPHOLOGY	COMMENTS
		<0.01	0.6	0.1		

COMMENTS: Estimates of original percent of olivine and orthopyroxene only tentative.

TS: 13 195-1200A-12R-1, 3-7 cm (Piece 1) **Unit 1** **OBSERVER: IS, MD, MK**

ROCK NAME: **Moderately altered serpentinite (after harzburgite)**

GRAIN SIZE: **Fine- to medium-grained**

TEXTURE: **Mesh**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	max.	av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
Olivine	30	59	<0.01	0.2	0.05	Mg-rich	Subhedral to anhedral	Strained.
Orthopyroxene	30	39	0.1	4	2	Mg-rich	Subhedral to anhedral	Strained.
Clinopyroxene	1	1			0.2	Mg-rich	Subhedral to anhedral	
Amphibole								
OPAQUE MINERALS								
Magnetite	<1						Dust-like	
Cr-spinel	1	1	<0.1	1	0.5			
Sulfide								

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	max.	av.		REPLACING / FILLING	COMMENTS
Antigorite							
Lizardite							
Chrysotile							
Serpentine	25			0.1		Olivine and orthopyroxene	
Brucite	10			0.05		Olivine and orthopyroxene	
Chlorite	1					Vein filling	
Talc							
Carbonate							
Amphibole	1				Anthophyllite?	After orthopyroxene	
Clay minerals							

VEINS	LOCATION	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS
		<0.1	0.8	0.2		Only few small veins.

COMMENTS:

TS: 14 195-1200A-13R-1, 28-32 cm (Piece 6B) **Unit 1** **OBSERVER: IS, MD, MK**

ROCK NAME: **Highly altered serpentinite (after harzburgite)**
GRAIN SIZE: **Fine- to medium-grained**
TEXTURE: **Mesh, bastite**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	max.	av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
Olivine	20	53	<0.01	0.2	0.1		Subhedral to anhedral	
Orthopyroxene	30	42	<0.1	3	2		Subhedral to anhedral	
Clinopyroxene	1	2			0.2		Subhedral to anhedral	
Amphibole								
OPAQUE MINERALS								
Magnetite	<1						Dust-like, subhedral in cpx	Small grains in clinopyroxene.
Cr-spinel	2	3	<0.1	1	0.4		Euhedral to anhedral	
Sulfide								

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	max.	av.	REPLACING / FILLING	COMMENTS
Antigorite						
Lizardite						
Chrysotile						
Serpentine	30			0.2	Olivine and orthopyroxene	
Brucite	16			0.1	Olivine and orthopyroxene	
Chlorite						
Talc						
Carbonate						
Amphibole						
Clay minerals						

VEINS	LOCATION	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS
		<0.1	2	0.5		"Frankenstein"-type vein.

COMMENTS: The slide has a central vein cross-cut by finer subsidiary veins.

TS: 15 195-1200A-13R-1, 12-16 cm (Piece 3) **Unit 1** **OBSERVER: IS, MD, MK**

ROCK NAME: **Completely altered serpentinite (after dunite?)**

GRAIN SIZE: **Fine-grained**

TEXTURE: **Mesh**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	max.	av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
Olivine	3	98	<0.05	0.2	0.1		Anhedral	Strained.
Orthopyroxene								
Clinopyroxene								
Amphibole								
OPAQUE MINERALS								
Magnetite	1						Dust-like, sometimes euhedral	
Cr-spinel	1	2	0.1	0.8	0.4		Euhedral to anhedral	
Sulfide								

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	max.	av.	REPLACING / FILLING	COMMENTS
Antigorite						
Lizardite						
Chrysotile						
Serpentine	60				Olivine	
Brucite						
Chlorite	35				Vein filling	
Talc						
Carbonate						
Amphibole						
Clay minerals						

VEINS	LOCATION	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS
		<0.1	4	2		

COMMENTS: Banded rock.

TS: 16 195-1200A-10R-1, 93-96 cm (Piece 11) **Unit 1** **OBSERVER: IS, MD, MK**

ROCK NAME: **Highly altered serpentinite (after harzburgite or lherzolite)**

GRAIN SIZE: **Fine- to medium-grained**

TEXTURE: **Mesh, hourglass**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	max.	av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
Olivine	10	67	0.01	0.2	0.1	Mg-rich	Anhedral	Sometimes strained.
Orthopyroxene	15	25	0.2	2	1.5	Mg-rich	Anhedral	Sometimes strained.
Clinopyroxene	5	7	0.1	0.5	0.2	Mg-rich	Subhedral to anhedral	
Amphibole								
OPAQUE MINERALS								
Magnetite	2						After Cr-spinel and in cpx	
Cr-spinel	<1	1	0.05	0.4	0.2		Embayed	
Sulfide								

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	max.	av.	REPLACING / FILLING	COMMENTS
Antigorite						
Lizardite						
Chrysotile						
Serpentine	50			0.1	Olivine and orthopyroxene	
Brucite	16			0.05	Olivine and orthopyroxene	
Chlorite	2				Vein filling	
Talc						
Carbonate						
Amphibole						
Clay minerals						

VEINS	LOCATION	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS

COMMENTS: Few small veins.

TS: 17 195-1200A-11R-1, 13-18 cm (Piece 5) **Unit 1** **OBSERVER: IS, MD, MK**

ROCK NAME: **Completely altered serpentinite**

GRAIN SIZE: **Fine-grained**

TEXTURE: **Mesh, hourglass**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	SIZE (mm) max.	SIZE (mm) av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
Olivine								
Orthopyroxene	2			1			Subhedral to anhedral	
Clinopyroxene								
Amphibole								
OPAQUE MINERALS								
Magnetite	1						Dust-like	
Cr-spinel	<1				1			
Sulfide								

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	SIZE (mm) max.	SIZE (mm) av.		REPLACING / FILLING	COMMENTS
Antigorite							
Lizardite							
Chrysotile							
Serpentine	68			0.1			
Brucite	25			0.1			
Chlorite	3			0.05			
Talc							
Carbonate							
Amphibole	<1			0.05	anthophyllite?		
Clay minerals							

VEINS	LOCATION	SIZE (mm) min.	SIZE (mm) max.	SIZE (mm) av.	FILLING / MORPHOLOGY	COMMENTS
						Veins filled with quartz, phlogopite (?), hematite (?).

COMMENTS: The rock is completely serpentinized; it is impossible to estimate original percent of primary minerals and primary composition.

TS: 18 195-1200A-11R-1, 63-65 cm (Piece 11) **Unit 1** **OBSERVER: IS, MD, MK**
ROCK NAME: **Very highly altered serpentinite (after harzburgite)**
GRAIN SIZE: **Fine- to medium-grained**
TEXTURE: **Mesh, hourglass**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	max.	av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
Olivine	5	82	0.01	0.2	0.05	Mg-rich	Anhedral	Sometimes strained.
Orthopyroxene	10	16	0.2	2	0.8	Mg-rich	Anhedral	Sometimes strained.
Clinopyroxene	<1	1				Mg-rich	Subhedral to anhedral	
Amphibole								
OPAQUE MINERALS								
Magnetite	2				0.05		After Cr-spinel and in cpx	
Cr-spinel	<1	1	0.05	1	0.1		Embayed	
Sulfide								

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	max.	av.	REPLACING / FILLING	COMMENTS
Antigorite						
Lizardite						
Chrysotile						
Serpentine	73			0.1	Olivine and orthopyroxene	
Brucite	9			0.05	Olivine and orthopyroxene	
Chlorite						
Talc						
Carbonate						
Amphibole						
Clay minerals						

VEINS	LOCATION	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS
		<0.1	4			One large and many tiny veins.

COMMENTS:

TS: 19 195-1200A-13R-1, 25-27 cm (Piece 6) **Unit 1** **OBSERVER: IS, MD, MK**

ROCK NAME: **Very highly altered serpentinite (after harzburgite)**

GRAIN SIZE: **Fine-grained**

TEXTURE: **Mesh, hourglass**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	max.	av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
Olivine	5	70	0.01	0.2	0.05	Mg-rich	Anhedral	Sometimes strained.
Orthopyroxene	10	25	0.3	3	1	Mg-rich	Anhedral	Sometimes strained.
Clinopyroxene	1	2			0.3	Mg-rich	Subhedral to anhedral	Contains magnetite.
Amphibole								
OPAQUE MINERALS								
Magnetite	1						After Cr-spinel and in cpx	
Cr-spinel	2	3	0.05	0.8	0.5		Subhedral to embayed	
Sulfide								

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	max.	av.	REPLACING / FILLING	COMMENTS
Antigorite						
Lizardite						
Chrysotile						
Serpentine	65			0.1	Olivine and orthopyroxene	
Brucite	16			0.05	Olivine and orthopyroxene	
Chlorite						
Talc						
Carbonate						
Amphibole						
Clay minerals						

VEINS	LOCATION	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS

COMMENTS: Few small veins.

TS: 20 195-1200A-13R-1, 64-66 cm (Piece 7) **Unit 1** **OBSERVER: IS, MD, MK**

ROCK NAME: **Very highly altered serpentinite (after harzburgite)**

GRAIN SIZE: **Fine-grained**

TEXTURE: **Mesh, hourglass**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	max.	av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
Olivine	20	83	0.01	0.2	0.05	Mg-rich	Anhedral	Sometimes strained.
Orthopyroxene	10	12	0.1	2	0.8	Mg-rich	Anhedral	Sometimes strained.
Clinopyroxene	<1	2				Mg-rich	Anhedral	
Amphibole								
OPAQUE MINERALS								
Magnetite	1						Dust-like	
Cr-spinel	2	3	0.05	0.8	0.4		Euhedral to embayed	
Sulfide								

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	max.	av.	REPLACING / FILLING	COMMENTS
Antigorite						
Lizardite						
Chrysotile						
Serpentine	54			0.1	Olivine and orthopyroxene	
Brucite	10			0.05	Olivine and orthopyroxene	
Chlorite						
Talc						
Carbonate	2			0.05	Scattered	
Amphibole						
Clay minerals						

VEINS	LOCATION	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS
				0.3		

COMMENTS: Few small veins.

TS: 21 195-1200A-13R-1, 89-92 cm (Piece 8B) **Unit 1** **OBSERVER: IS, MD, MK**

ROCK NAME: **Very highly altered serpentinite (after harzburgite)**

GRAIN SIZE: **Fine- to medium-grained**

TEXTURE: **Mesh, hourglass**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	SIZE (mm) max.	SIZE (mm) av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
Olivine	10	60	0.01	0.2	0.05	Mg-rich	Anhedral	Sometimes strained.
Orthopyroxene	10	37	0.1	2	0.8	Mg-rich	Anhedral	Sometimes strained.
Clinopyroxene	<1	1			0.2	Mg-rich	Anhedral	
Amphibole								
OPAQUE MINERALS								
Magnetite	3						Dust-like	
Cr-spinel	1	2	0.1	0.8	0.4		Embayed	
Sulfide								

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	SIZE (mm) max.	SIZE (mm) av.	REPLACING / FILLING	COMMENTS
Antigorite						
Lizardite						
Chrysotile						
Serpentine	65			0.1	Olivine and orthopyroxene	
Brucite	10			0.01	Olivine and orthopyroxene	
Chlorite						
Talc						
Carbonate						
Amphibole						
Clay minerals						

VEINS	LOCATION	SIZE (mm) min.	SIZE (mm) max.	SIZE (mm) av.	FILLING / MORPHOLOGY	COMMENTS
		<0.01	0.8	0.2		

COMMENTS:

TS: 22 195-1200A-14R-1, 1-3 cm (Piece 1) **Unit 1** **OBSERVER: IS, MD, MK**

ROCK NAME: **Completely altered serpentinite**
GRAIN SIZE: **Fine-grained**
TEXTURE: **Mesh, hourglass**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	max.	av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
Olivine	1		0.01	0.2	0.05		Anhedral	
Orthopyroxene								
Clinopyroxene								
Amphibole								
OPAQUE MINERALS								
Magnetite	2						Dust-like	
Cr-spinel	<1		0.05	0.8	0.2		Embayed	
Sulfide								

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	max.	av.	REPLACING / FILLING	COMMENTS
Antigorite						
Lizardite						
Chrysotile						
Serpentine	85				Olivine and orthopyroxene	
Brucite	11				Olivine and orthopyroxene	
Chlorite						
Talc						
Carbonate						
Amphibole	<1			0.1	Scattered	
Clay minerals						

VEINS	LOCATION	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS
				0.1		

COMMENTS: The rock is almost completely serpentinized, and estimates of the original percent of primary minerals and composition are impossible.

TS: 23 195-1200A-14R-1, 22-25 cm (Piece 6) **Unit 1** **OBSERVER: IS, MD, MK**

ROCK NAME: **Very highly altered serpentinite (after harzburgite)**

GRAIN SIZE: **Fine-grained**

TEXTURE: **Mesh, granoblastic**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	max.	av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
Olivine	15	66	0.01	0.2	0.05		Anhedral	Forms granoblasts.
Orthopyroxene	20	31	0.1	2	0.4		Anhedral	
Clinopyroxene	2	2	0.05	0.5	0.1		Subhedral	
Amphibole								
OPAQUE MINERALS								
Magnetite	2						Dust-like	
Cr-spinel	<1	1					Anhedral to embayed	
Sulfide								

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	max.	av.	REPLACING / FILLING	COMMENTS
Antigorite						
Lizardite						
Chrysotile						
Serpentine	42			0.2	Olivine and orthopyroxene	
Brucite	15			0.05	Olivine and orthopyroxene	
Chlorite	3			0.1	Orthopyroxene, vein filling	
Talc						
Carbonate						
Amphibole						
Clay minerals						

VEINS	LOCATION	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS

COMMENTS:

TS: 24 195-1200A-16R-1, 21-24 cm (Piece 5) **Unit 1** **OBSERVER: IS, MD, MK**

ROCK NAME: **Completely altered serpentinite**
GRAIN SIZE: **Fine-grained**
TEXTURE: **Mesh**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	SIZE (mm) max.	SIZE (mm) av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
Olivine								
Orthopyroxene	5				0.5		Anhedral	Forms granoblasts.
Clinopyroxene								
Amphibole								
OPAQUE MINERALS								
Magnetite	<1						Dust-like	
Cr-spinel	<1				0.1		Anhedral to embayed	
Sulfide								

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	SIZE (mm) max.	SIZE (mm) av.	REPLACING / FILLING	COMMENTS
Antigorite						
Lizardite						
Chrysotile						
Serpentine	84			0.1	Olivine and orthopyroxene	
Brucite	10			0.1	Olivine and orthopyroxene	
Chlorite						
Talc						
Carbonate						
Amphibole						
Clay minerals						

VEINS	LOCATION	SIZE (mm) min.	SIZE (mm) max.	SIZE (mm) av.	FILLING / MORPHOLOGY	COMMENTS

COMMENTS: The rock is almost completely serpentinized, and estimates of the original percent of primary minerals and composition are impossible.

TS: 25 195-1200A-16R-1, 112-115 cm (Piece 11B) **Unit 1** **OBSERVER: IS, MD, MK**

ROCK NAME: **Very highly altered serpentinite (after harzburgite)**

GRAIN SIZE: **Fine-grained**

TEXTURE: **Mesh, bastite, hourglass**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	max.	av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
Olivine	5	60	0.05	0.8	0.2		Anhedral	
Orthopyroxene	10	38	0.1	4	0.5		Anhedral	
Clinopyroxene	1	1			0.2		Subhedral	
Amphibole								
OPAQUE MINERALS								
Magnetite	<1						Dust-like	
Cr-spinel	1	1			0.2		Subhedral to embayed	
Sulfide								

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	max.	av.	REPLACING / FILLING	COMMENTS
Antigorite						
Lizardite						
Chrysotile						
Serpentine	58			0.1	Olivine and orthopyroxene	
Brucite	21			0.05	Olivine and orthopyroxene	
Chlorite	3			0.05	Orthopyroxene	
Talc						
Carbonate						
Amphibole						
Clay minerals						

VEINS	LOCATION	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS

COMMENTS: Remnants of altered olivine are included as chadacrysts in relatively fresh orthopyroxene grains, implying cumulate texture.

TS: 26 195-1200A-16R-2, 15-17 cm (Piece 1) **Unit 1** **OBSERVER: IS, MD, MK**

ROCK NAME: **Highly altered serpentinite (after harzburgite or lherzolite)**

GRAIN SIZE: **Fine- to medium-grained**

TEXTURE: **Mesh, bastite, hourglass**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	max.	av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
Olivine	20	40	0.05	0.2	0.1		Anhedral	Strained.
Orthopyroxene	15	54	0.3	3	0.8		Anhedral	Exsolution lamellae of clinopyroxene.
Clinopyroxene	5	5	0.1	0.4	0.2		Subhedral	Inclusions of magnetite.
Amphibole								
OPAQUE MINERALS								
Magnetite	<1						Dust-like	
Cr-spinel	1	1					Embayed	
Sulfide								

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	max.	av.	REPLACING / FILLING	COMMENTS
Antigorite						
Lizardite						
Chrysotile						
Serpentine	41				Olivine and orthopyroxene	
Brucite	16				Olivine and orthopyroxene	
Chlorite	1				Orthopyroxene	
Talc						
Carbonate						
Amphibole						
Clay minerals						

VEINS	LOCATION	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS

COMMENTS:

TS: 27 195-1200A-16R-2, 45-48 cm (Piece 4) **Unit 1** **OBSERVER: IS, MD, MK**
ROCK NAME: **Completely altered serpentinite**
GRAIN SIZE: **Fine-grained**
TEXTURE: **Mesh, hourglass**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	max.	av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
Olivine								
Orthopyroxene								
Clinopyroxene								
Amphibole								
OPAQUE MINERALS								
Magnetite	5						Dust-like in veins; after Cr-spinel	
Cr-spinel	<1		0.04	0.8	0.4		Euhedral to embayed	
Sulfide								

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	max.	av.	REPLACING / FILLING	COMMENTS
Antigorite						
Lizardite						
Chrysotile						
Serpentine	81				Olivine and orthopyroxene	
Brucite	13				Olivine and orthopyroxene	
Chlorite						
Talc						
Carbonate						
Amphibole						
Clay minerals						

VEINS	LOCATION	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS

COMMENTS: The rock is almost completely serpentinized, and estimates of the original percent of primary minerals and composition are impossible.

TS: 28 195-1200A-17G-2, 29-31 cm (Piece 2) **Unit 1** **OBSERVER: IS, MD, MK**

ROCK NAME: **Very highly altered serpentinite (after harzburgite)**

GRAIN SIZE: **Fine-grained**

TEXTURE: **Mesh, bastite, hourglass**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	max.	av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
Olivine	3	60	0.01	0.2	0.05		Anhedral	
Orthopyroxene	10	38			0.5		Anhedral	
Clinopyroxene	1	1			0.2		Subhedral	
Amphibole								
OPAQUE MINERALS								
Magnetite	<1						Dust-like	
Cr-spinel	1	1	0.04	2	0.4		Subhedral to embayed	
Sulfide								

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	max.	av.	REPLACING / FILLING	COMMENTS
Antigorite						
Lizardite						
Chrysotile						
Serpentine	65			0.1	Olivine and orthopyroxene	
Brucite	17			0.05	Olivine and orthopyroxene	
Chlorite	2			0.05	Orthopyroxene	
Talc						
Carbonate						
Amphibole						
Clay minerals						

VEINS	LOCATION	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS
		0.01	4	0.4		

COMMENTS:

TS: 29 195-1200A-9R-1, 5-8 cm (Piece 2) **Unit 1** **OBSERVER: IS, MD, MK**
ROCK NAME: **Completely altered serpentinite**
GRAIN SIZE: **Fine-grained**
TEXTURE: **Mesh, bastite**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	max.	av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
Olivine								
Orthopyroxene								
Clinopyroxene								
Amphibole								
OPAQUE MINERALS								
Magnetite	<1						After Cr-spinel	
Cr-spinel	<1		0.05	0.5	0.2		Embayed	
Sulfide								

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	max.	av.	REPLACING / FILLING	COMMENTS
Antigorite						
Lizardite						
Chrysotile						
Serpentine	78			0.1	Olivine and orthopyroxene	
Brucite	20			0.05	Olivine and orthopyroxene	
Chlorite						
Talc						
Carbonate						
Amphibole	1			0.05	Scattered	
Clay minerals						

VEINS	LOCATION	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS
		0.01	1.2	0.5		

COMMENTS: The rock is almost completely serpentinized, and estimates of the original percent of primary minerals and composition are impossible.

TS: 30 195-1200A-9R-1, 13-17 cm (Piece 4A) **Unit 1** **OBSERVER: IS, MD, MK**
ROCK NAME: **Completely altered serpentinite**
GRAIN SIZE: **Fine-grained**
TEXTURE: **Mesh, hourglass**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	max.	av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
Olivine								
Orthopyroxene								
Clinopyroxene								
Amphibole								
OPAQUE MINERALS								
Magnetite	3						Dust-like in veins	
Cr-spinel	<1				0.4		Euhedral to embayed	
Sulfide								

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	max.	av.	REPLACING / FILLING	COMMENTS
Antigorite						
Lizardite						
Chrysotile						
Serpentine	84			0.1	Olivine and orthopyroxene	
Brucite	12			0.05	Olivine and orthopyroxene	
Chlorite						
Talc						
Carbonate						
Amphibole						
Clay minerals						

VEINS	LOCATION	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS

COMMENTS: The rock is almost completely serpentinized, and estimates of the original percent of primary minerals and composition are impossible.

TS: 31 195-1200A-10R-1, 65-68 cm (Piece 9) **Unit 1** **OBSERVER: IS, MD, MK**

ROCK NAME: **Completely altered serpentinite**

GRAIN SIZE: **Fine-grained**

TEXTURE: **Mesh, bastite**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	max.	av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
Olivine								
Orthopyroxene								
Clinopyroxene								
Amphibole								
OPAQUE MINERALS								
Magnetite	2						Dust-like in veins; after Cr-spinel	
Cr-spinel	1				0.4		Anhedral to embayed	
Sulfide								

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	max.	av.	REPLACING / FILLING	COMMENTS
Antigorite						
Lizardite						
Chrysotile						
Serpentine	75			0.2	Olivine and orthopyroxene	
Brucite	16			0.05	Olivine and orthopyroxene	
Chlorite						
Talc						
Carbonate						
Amphibole	6				Tremolite/ Anthophillite	Fibrous
Clay minerals						

VEINS	LOCATION	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS

COMMENTS: The rock is almost completely serpentinized, and estimates of the original percent of primary minerals and composition are impossible.

TS: 32 195-1200A-11R-1, 1-3 cm (Piece 1) **Unit 1** **OBSERVER: IS, MD, MK**

ROCK NAME: **Completely altered serpentinite**

GRAIN SIZE: **Fine-grained**

TEXTURE: **Mesh, bastite**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	SIZE (mm) max.	SIZE (mm) av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
Olivine								
Orthopyroxene								
Clinopyroxene								
Amphibole								
OPAQUE MINERALS								
Magnetite	2						Dust-like in veins	
Cr-spinel	1		0.05	1.4	0.4		Embayed	
Sulfide								

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	SIZE (mm) max.	SIZE (mm) av.	REPLACING / FILLING	COMMENTS
Antigorite						
Lizardite						
Chrysotile						
Serpentine	79			0.2	Olivine and orthopyroxene	
Brucite	17			0.05	Olivine and orthopyroxene	
Chlorite						
Talc	1				Vein filling	
Carbonate						
Amphibole						
Clay minerals						

VEINS	LOCATION	SIZE (mm) min.	SIZE (mm) max.	SIZE (mm) av.	FILLING / MORPHOLOGY	COMMENTS

COMMENTS: The rock is almost completely serpentinized, and estimates of the original percent of primary minerals and composition are impossible.

TS: 33 195-1200A-12R-1, 25-27 cm (Piece 3) **Unit 1** **OBSERVER: IS, MD, MK**

ROCK NAME: **Highly altered serpentinite (after harzburgite)**
WHERE SAMPLED: **South Chamorro Seamount summit**
GRAIN SIZE: **Fine- to medium-grained**
TEXTURE: **Mesh, bastite, hourglass**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	max.	av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
Olivine	35	80	0.01	0.8	0.4		Anhedral	Kink banded.
Orthopyroxene	10	15	0.1	2	1		Anhedral	Exsolution lamellae of clinopyroxene.
Clinopyroxene	1	1			0.4		Subhedral	Inclusions of magnetite.
Amphibole								
OPAQUE MINERALS								
Magnetite	2						Dust-like	
Cr-spinel	3	4	0.04	2	0.2		Subhedral to embayed	
Sulfide								

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	max.	av.	REPLACING / FILLING	COMMENTS
Antigorite						
Lizardite						
Chrysotile						
Serpentine	35			0.1	Olivine and orthopyroxene	
Brucite	10			0.05	Olivine and orthopyroxene	
Chlorite	4			0.1	Vein filling; after orthopyroxene	
Talc						
Carbonate						
Amphibole						
Clay minerals						

VEINS	LOCATION	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS
				0.3		

COMMENTS:

TS: 34 195-1200A-14R-1, 29-31 cm (Piece 7) **Unit 1** **OBSERVER: IS, MD, MK**

ROCK NAME: **Highly altered serpentinite (after harzburgite)**

GRAIN SIZE: **Fine-grained**

TEXTURE: **Mesh**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	max.	av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
Olivine	10	73	0.01	0.2	0.05		Anhedral	
Orthopyroxene	15	25	0.05	2	0.8		Anhedral	
Clinopyroxene	1	1	0.3	0.7	0.2		Subhedral to anhedral	Many scattered small grains.
Amphibole								
OPAQUE MINERALS								
Magnetite	1						Dust-like	
Cr-spinel	1	1	0.01	2	0.4		Anhedral to subhedral	
Sulfide								

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	max.	av.		REPLACING / FILLING	COMMENTS
Antigorite							
Lizardite							
Chrysotile							
Serpentine	65			0.2		Olivine and orthopyroxene	
Brucite	6			0.05		Olivine and orthopyroxene	
Chlorite	1						
Talc							
Carbonate							
Amphibole	1				Tremolite?		
Clay minerals							

VEINS	LOCATION	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS
		0.05	0.5	0.2		

COMMENTS:

TS: 35 195-1200A-11R-1, 21-23 cm (Piece 6) **Unit 1** **OBSERVER: IS, MD, MK**
ROCK NAME: **Completely altered serpentinite**
GRAIN SIZE: **Fine-grained**
TEXTURE: **Felty**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	max.	av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
Olivine								
Orthopyroxene								
Clinopyroxene								
Amphibole								
OPAQUE MINERALS								
Magnetite								
Cr-spinel	2				0.4		Anhedral to subhedral	
Sulfide								

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	max.	av.	REPLACING / FILLING	COMMENTS
Antigorite						
Lizardite						
Chrysotile						
Serpentine	80			0.2	Olivine and orthopyroxene	
Brucite	18			0.05	Olivine and orthopyroxene	
Chlorite						
Talc						
Carbonate						
Amphibole						
Clay minerals						

VEINS	LOCATION	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS

COMMENTS: The rock is almost completely serpentinized, and estimates of the original percent of primary minerals and composition are impossible.

TS: 36 195-1200B-1W-1, 76-78 cm (Piece 5B) **Unit** **OBSERVER: IS, MD, MK**

ROCK NAME: **Completely altered serpentinite (after harzburgite?)**

GRAIN SIZE: **Fine- to coarse-grained**

TEXTURE: **Mesh, cumulate, hourglass**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	max.	av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
Olivine	<1	73						
Orthopyroxene		25	0.4	7	2		Subhedral	Pseudomorphs of serpentine and chlorite.
Clinopyroxene		2						
Amphibole								
OPAQUE MINERALS								
Magnetite	5						Dust-like vein filling; euhedral	Euhedral when rimming altered mafic crystals.
Cr-spinel	1		0.1	1.4	0.4		Euhedral to anhedral	
Sulfide								

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	max.	av.	REPLACING / FILLING	COMMENTS
Antigorite						
Lizardite						
Chrysotile						
Serpentine	75				Olivine, orthopyroxene	2 types: in veins, and after olivine-mesh texture.
Brucite	15				Olivine, orthopyroxene	
Chlorite	1				Vein filling	
Talc						
Carbonate						
Amphibole	2				Exsolution lamellae of cpx	
Clay minerals						

VEINS	LOCATION	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS
				0.1	Fibrous serpentine	

COMMENTS: Small relict olivine crystals are poikilitically included in former orthopyroxene grains, now altered to serpentine and brucite.

TS: 37 195-1200B-2W-1, 77-81 cm (Piece 8) **Unit** **OBSERVER: IS, MD, MK**

ROCK NAME: **Very highly altered serpentinite (after harzburgite)**

GRAIN SIZE: **Fine- to coarse-grained**

TEXTURE: **Mesh, bastite**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	max.	av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
Olivine	5	72	0.1	1	0.5	Mg-rich	Anhedral	
Orthopyroxene	7	25	0.1	2	1	Mg-rich	Anhedral	
Clinopyroxene	1	1			0.2	Mg-rich	Anhedral	
Amphibole								
OPAQUE MINERALS								
Magnetite	2						Dust-like vein filling; after Opx	
Cr-spinel	1	2	0.05	1	0.3		Subhedral to embayed	
Sulfide								

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	max.	av.		REPLACING / FILLING	COMMENTS
Antigorite							
Lizardite							
Chrysotile							
Serpentine	67					Olivine, orthopyroxene	
Brucite	10					Olivine, orthopyroxene	
Chlorite	2					Vein filling	
Talc							
Carbonate							
Amphibole	5	0.1	2	0.4	Anthophyllite?	Vein filling, scattered	
Clay minerals							

VEINS	LOCATION	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS
		0.1	2	0.2		

COMMENTS: The rock comprises two portions: one is completely serpentinized, the other is only partially serpentinized.

TS: 38 195-1200B-2W-2, 2-6 cm (Piece 1) **Unit** **OBSERVER: IS, MD, MK**

ROCK NAME: **Highly altered serpentinite (after harzburgite)**

GRAIN SIZE: **Medium- to fine-grained**

TEXTURE: **Felty, bastite**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	SIZE (mm) max.	SIZE (mm) av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
Olivine	25	70	0.4	1.2	0.8	Mg-rich	Anhedral	Strongly strained.
Orthopyroxene		25						Exsolution lamellae of clinopyroxene in former orthopyroxene(?).
Clinopyroxene	2	3			0.2	Mg-rich	Anhedral	
Amphibole								
OPAQUE MINERALS								
Magnetite	3						Dust-like in veins, euhedral within or after mafic phases	
Cr-spinel	1	2			0.4		Anhedral to embayed	
Sulfide								

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	SIZE (mm) max.	SIZE (mm) av.	REPLACING / FILLING	COMMENTS
Antigorite						
Lizardite						
Chrysotile						
Serpentine	44				Olivine, orthopyroxene	
Brucite	20				Olivine, orthopyroxene	
Chlorite	5				Orthopyroxene	
Talc						
Carbonate						
Amphibole						
Clay minerals						

VEINS	LOCATION	SIZE (mm) min.	SIZE (mm) max.	SIZE (mm) av.	FILLING / MORPHOLOGY	COMMENTS

COMMENTS: Banded and highly tectonized rock.

TS: 39 195-1200B-2W-1, 107-109 cm (Piece 12) **Unit** **OBSERVER: IS, MD, MK**

ROCK NAME: **Highly altered serpentinite (after harzburgite)**

GRAIN SIZE: **Coarse- to fine-grained**

TEXTURE: **Cumulate, mesh, ophitic**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	max.	av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
Olivine	23		<0.1	1.2	0.2	Mg-rich	Rounded; sometimes elongated	Strained.
Orthopyroxene	18		0.2	5	2	Mg-rich	Anhedral	Strained, kink banded.
Clinopyroxene	2				0.2	Mg-rich	Subhedral to anhedral	
Amphibole								
OPAQUE MINERALS								
Magnetite								
Cr-spinel	1		0.05	0.8	0.4		Subhedral to embayed	
Sulfide								

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	max.	av.	REPLACING / FILLING	COMMENTS
Antigorite						
Lizardite						
Chrysotile						
Serpentine	30				Olivine, orthopyroxene	
Brucite	20				Olivine, orthopyroxene	
Chlorite	6				Vein filling	
Talc						
Carbonate						
Amphibole						
Clay minerals						

VEINS	LOCATION	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS
				0.5		

COMMENTS: Orthopyroxene commonly encloses poikilitically olivine and sometimes clinopyroxene.

TS: 40 195-1200B-2W-1, 126-128 cm (Piece 15) **Unit** **OBSERVER: IS, MD, MK**

ROCK NAME: **Schist**
GRAIN SIZE: **Fine-grained**
TEXTURE: **Laminated**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	max.	av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
Olivine	<1							
Orthopyroxene								
Clinopyroxene	<1							
Amphibole								
OPAQUE MINERALS								
Magnetite								
Cr-spinel	<1							
Sulfide								

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	max.	av.	REPLACING / FILLING	COMMENTS
Antigorite						
Lizardite						
Chrysotile						
Serpentine	89					
Brucite	10					
Chlorite						
Talc						
Carbonate						
Amphibole						
Clay minerals						

VEINS	LOCATION	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS

COMMENTS:

TS: 41 195-1200B-2W-1, 129-131 cm (Piece 16) **Unit** **OBSERVER: IS, MD, MK**

ROCK NAME: **Very highly altered serpentinite (after harzburgite)**

GRAIN SIZE: **Medium- to fine-grained**

TEXTURE: **Bastite, mesh**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	max.	av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
Olivine	5	61	<0.1	0.8	0.3	Mg-rich	Anhedral	Strained, kink banded.
Orthopyroxene	5	34	0.2	3	0.8	Mg-rich	Anhedral	Strained, kink banded.
Clinopyroxene	1	1			0.2	Mg-rich	Subhedral to anhedral	
Amphibole								
OPAQUE MINERALS								
Magnetite	2						Dust-like in veins	
Cr-spinel	3	4	0.2	1.2	0.8		Euhedral to embayed	
Sulfide								

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	max.	av.	REPLACING / FILLING	COMMENTS
Antigorite						
Lizardite						
Chrysotile						
Serpentine	76				Olivine, orthopyroxene	
Brucite	5				Mostly orthopyroxene	
Chlorite	3				Orthopyroxene	
Talc						
Carbonate						
Amphibole						
Clay minerals						

VEINS	LOCATION	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS

COMMENTS: Central vein crosscut by subsidiary finer veins of chrysotile. The sample has been cut by several generations of veins, where relict grains of olivine and orthopyroxene are preserved in bands between veins.

TS: 42 195-1200D-1H-3, 89-93 cm (Piece 5) **Unit** **OBSERVER: IS, MD, MK**
ROCK NAME: **Completely altered serpentinite (after harzburgite?)**
GRAIN SIZE: **Medium- to fine-grained**
TEXTURE: **Bastite, mesh**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	max.	av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
Olivine		73						
Orthopyroxene		25						
Clinopyroxene								
Amphibole								
OPAQUE MINERALS								
Magnetite	10						Anhedral in veins, after orthopyroxene	
Cr-spinel		2						Turned to magnetite.
Sulfide								

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	max.	av.	REPLACING / FILLING	COMMENTS
Antigorite						
Lizardite						
Chrysotile						
Serpentine	50				Olivine, orthopyroxene	
Brucite	40				Mostly orthopyroxene, vein filling	Partially turned to hydromagnesite (?).
Chlorite						
Talc						
Carbonate						
Amphibole						
Clay minerals						

VEINS	LOCATION	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS

COMMENTS:

TS: 43 195-1200D-1H-2, 96-98 cm **Unit** **OBSERVER: IS, MD, MK**

ROCK NAME: **Completely altered serpentinite (after harzburgite?)**

GRAIN SIZE: **Fine-grained**

TEXTURE: **Mesh, hourglass**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	max.	av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
Olivine		78						
Orthopyroxene		20						
Clinopyroxene								
Amphibole								
OPAQUE MINERALS								
Magnetite	5							
Cr-spinel	1	1.5						
Sulfide								

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	max.	av.	REPLACING / FILLING	COMMENTS
Antigorite						
Lizardite						
Chrysotile						
Serpentine	74				Olivine, orthopyroxene	
Brucite	20				Mostly orthopyroxene	Partially turned to hydromagnesite (?).
Chlorite						
Talc						
Carbonate						
Amphibole						
Clay minerals						

VEINS	LOCATION	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS

COMMENTS:

TS: 44 195-1200D-1H-1, 66-70 cm **Unit** **OBSERVER: IS, MD. MK**
ROCK NAME: **Completely altered serpentinite (after harzburgite?)**
GRAIN SIZE: **Medium- to fine-grained**
TEXTURE: **Mesh**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	max.	av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
Olivine		87						
Orthopyroxene		10					Subhedral	Pseudomorphs of serpentine and chlorite.
Clinopyroxene								
Amphibole								
OPAQUE MINERALS								
Magnetite	10		0.01	0.7	0.1		Dust-like vein filling; anhedral	After Cr-spinel; aligned in former crystals; vein-filling.
Cr-spinel	<1	3					Anhedral	
Sulfide								

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	max.	av.	REPLACING / FILLING	COMMENTS
Antigorite						
Lizardite						
Chrysotile						
Serpentine	83				Olivine, orthopyroxene	
Brucite	1				Olivine, orthopyroxene	
Chlorite	5				Orthopyroxene, Cr-spinel	
Talc						
Carbonate						
Amphibole	<1				Orthopyroxene	
Clay minerals						

VEINS	LOCATION	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS

COMMENTS:

TS: 45 195-1200D-2H-1, 90-92 cm **Unit** **OBSERVER: IS, MD. MK**
ROCK NAME: **Completely altered serpentinite (after dunite or harzburgite)**
GRAIN SIZE: **Medium- to fine-grained**
TEXTURE: **Mesh**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	max.	av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
Olivine	1	89			0.2			
Orthopyroxene	1	10	0.1	2	1			
Clinopyroxene	<1				0.2			
Amphibole								
OPAQUE MINERALS								
Magnetite	2						Dust-like in veins	
Cr-spinel	1	1			0.4		Euhedral to anhedral	
Sulfide								

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	max.	av.	REPLACING / FILLING	COMMENTS
Antigorite						
Lizardite						
Chrysotile						
Serpentine	94				Olivine and orthopyroxene	
Brucite						
Chlorite						
Talc						
Carbonate						
Amphibole	<1					
Clay minerals						

VEINS	LOCATION	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS

COMMENTS:

TS: 46 195-1200D-8H-1, 115-120 cm **Unit** **OBSERVER: IS, MD, MK**
ROCK NAME: **Schist**
GRAIN SIZE: **Fine-grained**
TEXTURE: **Laminated**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	max.	av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
Olivine								
Orthopyroxene								
Clinopyroxene								
Amphibole								
OPAQUE MINERALS								
Magnetite								
Cr-spinel								
Sulfide								

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	max.	av.	REPLACING / FILLING	COMMENTS
Antigorite						
Lizardite						
Chrysotile						
Serpentine	5					
Brucite						
Chlorite	95					
Talc						
Carbonate						
Amphibole						
Clay minerals						

VEINS	LOCATION	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS

COMMENTS: A few small euhedral crystals of apatite(?).

TS: 47 195-1200D-9H-1, 16-20 cm **Unit** **OBSERVER: IS, MD, MK**

ROCK NAME: **Highly altered serpentinite (after harzburgite)**
GRAIN SIZE: **Medium- to fine-grained**
TEXTURE: **Mesh, bastite, cumulus**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	SIZE (mm) max.	SIZE (mm) av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
Olivine	13	68	0.1	0.8	0.4	Mg-rich		
Orthopyroxene	17	28	0.1	3	1	Mg-rich		Very strained.
Clinopyroxene	2	2			0.4	Mg-rich		Brown-reddish alteration.
Amphibole								
OPAQUE MINERALS								
Magnetite	1						After Cr-spinel, in clinopyroxene	
Cr-spinel	1	2	0.1	0.8	0.4		Subhedral to embayed	
Sulfide								

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	SIZE (mm) max.	SIZE (mm) av.	REPLACING / FILLING	COMMENTS
Antigorite						
Lizardite						
Chrysotile						
Serpentine	50				Olivine, orthopyroxene	
Brucite	11				Olivine, orthopyroxene	
Chlorite	5				Orthopyroxene	
Talc						
Carbonate						
Amphibole						
Clay minerals						

VEINS	LOCATION	SIZE (mm) min.	SIZE (mm) max.	SIZE (mm) av.	FILLING / MORPHOLOGY	COMMENTS

COMMENTS:

TS: 48 195-1200D-3H-1, 18-20 cm **Unit** **OBSERVER: IS, MD, MK**

ROCK NAME: **Highly altered serpentinite (after dunite)**
GRAIN SIZE: **Fine-grained**
TEXTURE: **Mesh, hourglass**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	max.	av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
Olivine	20	93	0.1	0.8	0.4	Mg-rich		Strained.
Orthopyroxene	3	5	0.1	0.4	0.2	Mg-rich		Strained.
Clinopyroxene	<1	<1				Mg-rich		
Amphibole								
OPAQUE MINERALS								
Magnetite	10						After Cr-spinel, dust-like in veins	
Cr-spinel	1	2	0.4	1.2	1		Euhedral to subhedral	
Sulfide								

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	max.	av.	REPLACING / FILLING	COMMENTS
Antigorite						
Lizardite						
Chrysotile						
Serpentine	60				Olivine, orthopyroxene	
Brucite	5				Olivine, orthopyroxene	
Chlorite						
Talc						
Carbonate						
Amphibole						
Clay minerals						

VEINS	LOCATION	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS

COMMENTS:

TS: 49 195-1200D-5H-1, 40-41 cm **Unit** **OBSERVER: IS, MD, MK**

ROCK NAME: **Highly altered serpentinite (after harzburgite)**
GRAIN SIZE: **Medium- to fine-grained**
TEXTURE: **Mesh, hourglass, bastite**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	max.	av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
Olivine	15	57	<0.1	0.8	0.4	Mg-rich		Sometimes strongly strained.
Orthopyroxene	5	40	0.1	2	0.8	Mg-rich		Strained.
Clinopyroxene	1	1			0.2	Mg-rich		
Amphibole								
OPAQUE MINERALS								
Magnetite	3						Dust-like in veins	
Cr-spinel	2	2					Euhedral to subhedral	
Sulfide								

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	max.	av.	REPLACING / FILLING	COMMENTS
Antigorite						
Lizardite						
Chrysotile						
Serpentine	64				Olivine, orthopyroxene	
Brucite	5				Olivine, orthopyroxene	
Chlorite	5				Orthopyroxene	
Talc						
Carbonate						
Amphibole						
Clay minerals						

VEINS	LOCATION	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS

COMMENTS:

TS: 50 195-1200D-5H-2, 80-83 cm **Unit** **OBSERVER: IS, MD, MK**

ROCK NAME: **Completely altered serpentinite (after dunite?)**

GRAIN SIZE: **Fine-grained**

TEXTURE: **Mesh, bastitic**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	max.	av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
Olivine		89						
Orthopyroxene		10						
Clinopyroxene								
Amphibole								
OPAQUE MINERALS								
Magnetite								
Cr-spinel		<1						
Sulfide								

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	max.	av.	REPLACING / FILLING	COMMENTS
Antigorite						
Lizardite						
Chrysotile						
Serpentine	99					
Brucite						
Chlorite	1					
Talc						
Carbonate						
Amphibole						
Clay minerals						

VEINS	LOCATION	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS
						Anastomizing veins.

COMMENTS:

TS: 51 195-1200F-1H-4, 34-36 cm **Unit** **OBSERVER: IS, MD, MK**

ROCK NAME: **Breccia**

GRAIN SIZE:

TEXTURE: **Foliated**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	max.	av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
Olivine								
Orthopyroxene								
Clinopyroxene								
Amphibole								
OPAQUE MINERALS								
Magnetite	X							
Cr-spinel								
Sulfide								

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	max.	av.	REPLACING / FILLING	COMMENTS
Antigorite						
Lizardite						
Chrysotile						
Serpentine	X					
Brucite	X					
Chlorite	X					
Talc						
Carbonate	X					
Amphibole	X					
Clay minerals						

VEINS	LOCATION	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS

COMMENTS: Since the rock is extremely heterogeneous, it is not possible to define grain-size or mineral percentage. The rock consists of matrix and three types of schist clasts. The matrix contains, in order of decreasing abundance: fibrous serpentine, chlorite, muscovite, biotite, glaucophane and magnetite. The largest clast is chlorite schist, with abundant chlorite and tremolite, and minor apatite and opaques. The second clast type is serpentinite, made up of hourglass-textured serpentine and/or magnetite. The third type of clast is entirely made up of crystals of glaucophane. "X" indicates the presence of the phases so marked.

TS: 52 195-1200F-2H-4, 8-10 cm **Unit** **OBSERVER:**
ROCK NAME: **Serpentine mud**
GRAIN SIZE:
TEXTURE:

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	max.	av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
Olivine								
Orthopyroxene								
Clinopyroxene	X							
Amphibole								
OPAQUE MINERALS								
Magnetite								
Cr-spinel								
Sulfide								

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	max.	av.	REPLACING / FILLING	COMMENTS
Antigorite						
Lizardite						
Chrysotile						
Serpentine	X					
Brucite	X					
Chlorite	X					
Talc						
Carbonate	X					
Amphibole	X					
Clay minerals						

VEINS	LOCATION	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS

COMMENTS: The rock is made up of matrix and one large fragment (about 70% of the thin section). The matrix is made up of serpentine with small crystals of carbonate, brucite, clinopyroxene, glaucophane and biotite. The fragment consists of mainly chlorite and carbonate, minor magnetite pseudomorph after Cr-spinel, and traces of amphibole. "X" indicates the presence of the phases so marked.

TS: 59 195-1200-F-1H-4, 6-8 cm **Unit** **OBSERVER:**
ROCK NAME: **Schist**
GRAIN SIZE: **Fine-grained**
TEXTURE:

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	max.	av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
Olivine								
Orthopyroxene								
Clinopyroxene								
Amphibole								
OPAQUE MINERALS								
Magnetite	5							
Cr-spinel	<1							
Sulfide								

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	max.	av.	REPLACING / FILLING	COMMENTS
Antigorite						
Lizardite						
Chrysotile						
Serpentine	47			1.2		Needles.
Brucite	7			0.05		Platy anhedral to subhedral grains associated with magnetite.
Chlorite						
Talc						
Carbonate	<1					
Amphibole						
Clay minerals						
Others	40					Presumably brucite altered to a hydromagnesite aggregate.

VEINS	LOCATION	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS

COMMENTS:

TS: 60 195-1200-F-1H-5, 18-20 cm **Unit** **OBSERVER: MD, MK**
ROCK NAME: **Schist**
GRAIN SIZE: **Fine-grained**
TEXTURE:

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	max.	av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
Olivine								
Orthopyroxene								
Clinopyroxene								
Amphibole								
OPAQUE MINERALS								
Magnetite	1							
Cr-spinel								
Sulfide								

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	max.	av.	REPLACING / FILLING	COMMENTS
Antigorite						
Lizardite						
Chrysotile						
Serpentine	4					
Brucite						
Chlorite	48					
Talc	47					
Carbonate						
Amphibole						
Clay minerals						

VEINS	LOCATION	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS

COMMENTS: The thin section has been made on two separate, but similar pieces. Apatite is found as accessory mineral.