

153-920A-1W-1 (Piece 3, 57 cm)
 Rock Name: SERPENTINIZED HARZBURGITE
 Grain size: Coarse.
 Texture: Porphyroclastic.

Observer: NOR

MARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	0	80			Totally replaced by serpentine.
Orthopyroxene.	0	20	<15	Elongate.	Kink banded.
ACCESSORY MINERAL NAME					
Spinel.	<1	<1	0.05–0.3	Anhedral.	Golden brown colored.
SECONDARY MINERAL NAME					
Serpentine.	99	REPLACING/ FILLING Olivine, orthopyroxene.		Mesh texture.	
Iron oxide minerals.	1	Olivine, orthopyroxene.	0.1–0.6		Concentrated at edges of serpentine mesh structures.
VEIN/FRACTURE FILLING					
Clay minerals and serpentine.	PERCENT 70		SIZE	ORIENTATION	
Pyrite.			30		

COMMENTS: #1L

Bastite pseudomorphs coarse-grained orthopyroxene. No evidence for coarse-grained olivine in protolith. Elongated orthopyroxene defines foliation.

153-920A-1W-1 (Piece 5, 69 cm)
 Rock Name: SERPENTINIZED HARZBURGITE
 Grain size: Coarse.
 Texture: Porphyroclastic.

Observer: NOR

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	10	74		Anhedral.	Kink banded; largely replaced by serpentine and opaque minerals.
Orthopyroxene.	15	25	4–10	Anhedral.	Colorless; contains clinopyroxene exsolution lamellae; kink banded; partially replaced by serpentine.
ACCESSORY MINERAL NAME					
Clinopyroxene.	<1	<1	0.4	Anhedral.	Colorless.
Spinel.	1	1	0.1–2	Anhedral.	Golden brown colored.
SECONDARY MINERAL NAME					
Serpentine.	75	REPLACING/ FILLING Olivine, orthopyroxene.			Mesh texture.
Tremolite.	<1	Orthopyroxene	0.4	Anhedral.	Replacing orthopyroxene along grain edges and cleavage planes.
Iron oxide minerals.	1		<1	Anhedral.	Associated with serpentine and concentrated along edges of mesh structure.
VEIN/FRACTURE FILLING					
Clay minerals and chlorite.	PERCENT		SIZE	ORIENTATION	
Serpentine, tremolite, opaque oxide minerals.	4–6				

COMMENTS: #3

Contains two sheared, fractured veins (1–2 mm thick) with an altered, recrystallized mineral assemblage (now actinolite-serpentine-chlorite). May have been pyroxenite.

SITE 920

153-920A-1W-1 (Piece 6, 73 cm)

Observer: NOR

Rock Name: SERPENTINIZED HARZBURGITE

Grain size: Coarse.

Texture: Porphyroclastic.

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	0	80			Totally replaced by serpentine and iron oxide minerals.
Orthopyroxene.	0	20	1-6	Anhedral.	Totally replaced by serpentine + brucite + tremolite.
ACCESSORY MINERAL NAME					
Spinel.	0	<1	0.8-1.2	Anhedral.	Totally replaced by opaque oxide minerals and titanite.
SECONDARY MINERAL NAME					
Serpentine.	98	REPLACING/ FILLING			Mesh texture.
Iron oxide minerals.	2	Olivine, orthopyroxene.			Mesh texture.
Tremolite(?).	<1	Orthopyroxene.			Replacing along cleavage planes.
VEIN/FRACTURE FILLING					
Zeolite and clay minerals, (brucite).	PERCENT		SIZE	ORIENTATION	
Serpentine and iron oxide and clay minerals.					

COMMENTS: #4

153-920A-2M-1 (Piece 4, 71 cm)

Observer: CDW

Rock Name: SERPENTINIZED HARZBURGITE

Grain size: Coarse.

Texture: Porphyroclastic.

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	15	83	0.2-1		Largely replaced by serpentine and iron oxide minerals.
Orthopyroxene.	10	12	1-5		Colorless, with clinopyroxene exsolution. Partly replaced by serpentine.
ACCESSORY MINERAL NAME					
Clinopyroxene.	<1	<1	1-2		Colorless.
Spinel.	<<1	<<1	0.2-1.5		Brown with black rims.
SECONDARY MINERAL NAME					
Serpentine.	70	REPLACING/ FILLING			Mesh texture.
Iron oxide minerals.	5	Olivine, orthopyroxene.	0.01-0.4		Within serpentine mesh texture.
		Olivine.			
VEIN/FRACTURE FILLING					
Serpentine.	PERCENT		SIZE	ORIENTATION	
			0.5		

COMMENTS: #1

Recrystallization of olivine into a fine-grained (several hundred micrometers) matrix with 120° triple junctions. Close-spaced subgrain boundaries in olivine and undulose extinction indicate poor recovery low-temperature conditions of deformation.

153-920A-2M-1 (Piece 7, 81 cm)

Observer: NOR

Rock Name: SERPENTINIZED HARZBURGITE

Grain size: Coarse.

Texture: Porphyroclastic.

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	0	80			Totally replaced by serpentine and iron oxide minerals.
Orthopyroxene.	0	20	1-5	Anhedral.	Totally replaced by serpentine, chlorite, brucite ± clay.
ACCESSORY MINERAL NAME					
Spinel.	0	<1	<0.5	Anhedral.	Totally replaced by iron oxide minerals.
Clinopyroxene.	1-2	<1		Anhedral.	
SECONDARY MINERAL NAME					
Serpentine.	PERCENT 98	REPLACING/FILLING Olivine, orthopyroxene.			Mesh texture.
Iron oxide minerals.	1	Olivine, orthopyroxene.	0.2-0.4		Associated with serpentine.
Clay minerals.	1	Orthopyroxene.			
VEIN/FRACTURE FILLING					
Serpentine and iron oxide minerals.	PERCENT		SIZE	ORIENTATION	
Clay minerals (latest stage) and serpentine and pyrite.			0.5		

COMMENTS: #2

No fresh spinel or clinopyroxene identified.

STRUCTURE

Anastomosing vein foliation is defined by closely spaced sets of parallel veins. The vein foliation wraps around serpentinized orthopyroxene porphyroclasts and serpentinization in the relict pressure shadows is characterized by a more isotropic mesh texture. This suggests the vein foliation is overgrowing an earlier shortening fabric. A thin conjugate set of veins cuts the anastomosing vein fabric at a high angle. The acute angle between the conjugate set is 31°. Orthopyroxene is totally replaced by bastite but relict subgrains can be seen.

153-920B-1W-1 (Piece 1, 0 cm)

Observer: KIY

Rock Name: SERPENTINIZED HARZBURGITE

Grain size: Coarse.

Texture: Porphyroclastic.

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	0	85			Totally replaced by serpentine and iron oxide minerals.
Orthopyroxene.	0	19	0.3-15	Anhedral.	Bastite pseudomorphs, slightly deformed.
ACCESSORY MINERAL NAME					
Spinel.	1	1	<0.4	Holly leaf.	Reddish brown. Commonly associated with bastite ghosts after original pyroxene.
SECONDARY MINERAL NAME					
Serpentine.	PERCENT 96	REPLACING/FILLING Olivine, orthopyroxene.			
Iron oxide minerals.	3	Olivine.			
VEIN/FRACTURE FILLING					
Serpentine and iron oxide minerals.	PERCENT		SIZE	ORIENTATION	
			<0.2		

COMMENTS: #2L

Weak elongation of bastite pseudomorphs.

SITE 920

153-920B-1W-2 (Piece 1C, 33 cm)

Observer: CDW

Rock Name: SERPENTINIZED HARZBURGITE

Grain size: Coarse.

Texture: Porphyroclastic.

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	0	85			
Orthopyroxene.	8	15	1.5-6	Anhedral.	Totally replaced by serpentine and iron oxide minerals. Colorless with clinopyroxene exsolution.
ACCESSORY MINERAL NAME					
Spinel.	<1	<1	0.015-2.5		Brown, cracked with iron oxide minerals around rims.
SECONDARY MINERAL NAME					
Serpentine.	86	REPLACING/ FILLING			
Iron oxide minerals.	=5	Olivine, orthopyroxene.	0.01-0.8		Occurs with serpentine orthopyroxene in mesh structure.
Tremolite.	<1	Olivine., Orthopyroxene.			Yellowish color, occurs along cleavage planes.
Talc.	<1	Orthopyroxene.			White to yellow, replacing tremolite and orthopyroxene.
Chlorite.	<<1	Pyroxene(?)			
VEIN/FRACTURE FILLING					
Serpentine and iron oxide minerals. Brucite.	PERCENT		SIZE 0.2-0.5	ORIENTATION	Occurs in places with talc ± brucite.

COMMENTS: #5
STRUCTURE

Anastomosing vein foliation defined by closely spaced sets of parallel veins is moderately developed. The vein foliation wraps around serpentinized orthopyroxene porphyroclasts. Thicker veins (0.3 mm) are oriented parallel and perpendicular to the anastomosing vein fabric. Orthopyroxene is totally replaced by bastite but relict subgrains can be seen.

153-920B-1W-2 (Piece 9, 134 cm)

Observer: CDW

Rock Name: SERPENTINIZED HARZBURGITE

Grain size: Coarse.

Texture: Porphyroclastic.

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	0	80			
Orthopyroxene.	0	20	1.5-8		Totally replaced by serpentine and iron oxide minerals. Colorless, some clinopyroxene exsolution lamellae.
ACCESSORY MINERAL NAME					
Spinel.	<1	<1	0.2-1		Brown, cracked, partially replaced by iron oxide minerals.
SECONDARY MINERAL NAME					
Serpentine.	95	REPLACING/ FILLING			Mesh texture.
Iron oxide minerals.	=5	Olivine, orthopyroxene.	0.02-0.5		Occurs with serpentine in the mesh texture.
Tremolite.	<1	Orthopyroxene.			Yellowish, occurs along cleavage planes.
VEIN/FRACTURE FILLING					
Serpentine and iron oxide minerals. Serpentine and brucite.	PERCENT		SIZE 0.2-0.4	ORIENTATION	Cross-fiber serpentine.

COMMENTS: #6

Matrix between the large bastites (previous orthopyroxenes) was composed of medium- to coarse-grained (at least 1 mm) olivine, as evident from the serpentine texture. Bastite shows evidence of weak deformation (sigmoidal shape).

153-920B-1W-3 (Piece 4, 46 cm)

Observer: CDW

Rock Name: SERPENTINIZED HARZBURGITE

Grain size: Coarse.

Texture: Porphyroclastic.

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	2	77	<4		
Orthopyroxene.	7	22	1-8		Clinopyroxene exsolution.
ACCESSORY MINERAL NAME					
Spinel.	<<1	<<1	0.15-0.4		Brown, altered to iron oxide minerals along cracks and rims.
SECONDARY MINERAL NAME					
Serpentine.	PERCENT ≈90	REPLACING/ FILLING Olivine, orthopyroxene.	0.02-0.4		Mesh texture.
Iron oxide minerals.	1	Orthopyroxene.			Occurs with serpentine in mesh texture.
Tremolite.	<1	Tremolite, orthopyroxene.			Replacement along cleavage planes.
Brucite(?).	<1	Pyroxene.			Replacement along cleavage planes. Has anomalous interference colors.
Chlorite.	<1				
VEIN/FRACTURE FILLING					
Serpentine ± brucite ± chlorite.	PERCENT		SIZE 0.1-0.2	ORIENTATION	

COMMENTS: #7

One corner of the thin section contains some unaltered olivine, but the rest is totally serpentinized.

STRUCTURE

Anastomosing vein foliation defined by closely spaced sets of parallel veins is moderately developed. The vein foliation wraps around bastite porphyroclasts. Thicker veins (0.3 mm) are oriented 45° to and crosscut the anastomosing vein fabric. The bent lattice structures of orthopyroxene grains are preserved in bastite. Olivine host grains contain straight subgrain boundaries. Subgrains are oriented at a high angle to the local anastomosing vein foliation.

153-920B-1W-3 (Piece 10, 109 cm)

Observer: KIY

Rock Name: SERPENTINIZED HARZBURGITE

Grain size: Coarse.

Texture: Porphyroclastic.

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	20	75	0.1-1.8	Anhedral	
Orthopyroxene.	10	20	0.5-12.0	Anhedral.	Contains exsolution of clinopyroxene.
ACCESSORY MINERAL NAME					
Clinopyroxene.	2	2-3	0.2-1.5	Anhedral.	Replaced by tremolite.
Spinel.	1	1	0.2-1.5	Anhedral.	
SECONDARY MINERAL NAME					
Serpentine.	PERCENT 70	REPLACING/ FILLING Olivine, orthopyroxene.			Mesh texture.
Tremolite.	3	Clinopyroxene.	<0.5		
Iron oxide minerals.	2	Olivine.			Occurs in association with mesh-textured serpentine.
Chlorite.	2	Clinopyroxene, serpentine.			
VEIN/FRACTURE FILLING					
Serpentine and iron oxide minerals. Tremolite and chlorite.	PERCENT		SIZE	ORIENTATION	

COMMENTS: #8

Orthopyroxene porphyroclasts occur as aggregates of polygonal grains with 120° triple junction, 3-4 mm in size. Locally these aggregates which comprise smaller polygonal grains are (0.5-1 cm in size). Olivine is equant with 120° triple junctions. Weak subgrain boundaries. Olivine grain size ranges from 0.7 to 2 mm.

153-920B-2R-1 (Piece 2, 17 cm)

Rock Name: SERPENTINIZED HARZBURGITE

Grain size: Coarse.

Texture: Porphyroclastic.

Observer: JAN

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	0	85-90			Totally replaced by serpentine and magnetite.
Orthopyroxene.	<1	10-15	1-7	Anhedral.	Serpentine pseudomorphs after orthopyroxene (bastite).

ACCESSORY MINERAL NAME

Chrome spinel.	<1	<1	0.5-2.5	Anhedral.	Golden brown.
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SECONDARY MINERAL NAME

SECONDARY MINERAL NAME	PERCENT	REPLACING/ FILLING	SIZE	MORPHOLOGY	DESCRIPTION
Serpentine.	95	Olivine and orthopyroxene.			Mesh-textured after olivine.
Magnetite.	3	Olivine.	0.002-0.04		Concentrated in strings or veins.
Chlorite.	<1	Olivine?	0.2		

VEIN/FRACTURE FILLING

VEIN/FRACTURE FILLING	PERCENT	SIZE	ORIENTATION	DESCRIPTION
Carbonate minerals.	<1	0.04		Crosscutting serpentinite veins at 65°.
Serpentine.	<1			
Talc.	<1	0.04		

COMMENTS: #9

STRUCTURE

Orthopyroxene pseudomorphs show undulose extinction. No pseudomorphs after clinopyroxene identified.

153-920B-2R-1 (Piece 4, 44 cm)

Rock Name: SERPENTINIZED HARZBURGITE

Grain size: Coarse.

Texture: Porphyroclastic.

Observer: CAN

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	0	89			
Orthopyroxene.	4	8	10	Anhedral.	Equant shape.

ACCESSORY MINERAL NAME

Clinopyroxene.	1	2	5	Anhedral.	Equant shape. Contains orthopyroxene exsolution.
Spinel.	<1	<1	0.5	Anhedral.	

SECONDARY MINERAL NAME

SECONDARY MINERAL NAME	PERCENT	REPLACING/ FILLING	SIZE	MORPHOLOGY	DESCRIPTION
Serpentine.	83	Olivine, orthopyroxene, clinopyroxene.			Mesh texture.
Iron oxide minerals.	2	Olivine, orthopyroxene, clinopyroxene.	0.02	Anhedral.	
Amphibole.	<1	Orthopyroxene, clinopyroxene.	0.04	Euhedral.	Fibrous habit.
Zircon.	Trace.	clinopyroxene.			In altered patch vein.

VEIN/FRACTURE FILLING

VEIN/FRACTURE FILLING	PERCENT	SIZE	ORIENTATION	DESCRIPTION
Serpentine.				Cross fiber.
Chlorite, clay and iron oxide minerals, and zircon.		15 mm		Irregular patch shape.

COMMENTS: #3L

STRUCTURE

There are three episodes of plastic deformation in this serpentinitized harzburgite. The first one producing equant pyroxene porphyroclasts and extensively recrystallized olivine neoblasts about 0.2 mm in size. The second episode is localized within two 0.3-cm-thick shear zones and produces ribbon-shaped orthopyroxene with aspect ratios up to 15:1, and fine-grained recrystallized orthopyroxene, clinopyroxene, and olivine (0.04 mm). It is likely to represent a lower temperature or higher stress ductile deformation. Shear sense may be reverse that of the orthopyroxene fabric. Finally, bands (0.5 mm thick) of finely recrystallized amphibole, parallel with the orthopyroxene-clinopyroxene-olivine shear zone, represents the last stages of ductile deformation in the rock.

A different patch of extensively altered rock occurs close to the shear band. It contains abundant euhedral zircon, and euhedral ghosts after pyroxenes, 0.3 to 2 mm in size, composed of chlorite and variable amounts of magnetite, apatite, in a matrix made of clay minerals and chlorite. Hexagonal-shaped ghosts after an undetermined primary mineral are also present. Some sulfide minerals are present in thin discontinuous veins.

153-920B-3R-1 (Piece 1B, 11 cm)

Observer: PAM

Rock Name: SERPENTINIZED HARZBURGITE

Grain size: Coarse.

Texture: Porphyroclastic.

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	0	85			
Orthopyroxene.	<1	15	5–10	Anhedral.	Highly altered, difficult to tell original size and shape.
ACCESSORY MINERAL NAME					
Spinel.	<<1	<1	1–2.5	Anhedral.	Red-brown colored.
SECONDARY MINERAL NAME					
Clay minerals.	<<1	REPLACING/ FILLING			
Iron oxide minerals.	1	Olivine, orthopyroxene, spinel.			Outlines edges and cross fibers of serpentine veins. Some sulfide mineralization along cracks.
Serpentine.	99	Olivine, orthopyroxene.			Mesh texture. Also replacing what may have been original clinopyroxene. Locally, chlorite in low abundance, possibly penninite.
VEIN/FRACTURE FILLING					
Serpentine and iron oxide minerals.	PERCENT		SIZE	ORIENTATION	
Carbonate, iron oxide and clay minerals.			<0.5		Most veins are thin and subparallel to the foliation; one thick vein (3 mm) occurs at a high angle to foliation.
Clay minerals.			<0.1		
			<0.1		Occurs at a high angle to foliation.

COMMENTS: #10

STRUCTURE

Evidence in bastite texture for recrystallization of previous large (7 mm) enstatite in finer grained (several hundred micrometers) matrix, along grain boundaries. Olivine was clearly coarse-grained before serpentinization, but original texture is obliterated in most of the thin section due to pervasive veining.

153-920B-3R-1 (Piece 3, 37 cm)

Observer: PAM

Rock Name: SERPENTINIZED HARZBURGITE

Grain size: Coarse.

Texture: Porphyroclastic.

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	0	65			
Orthopyroxene.	0	35	4–6		
ACCESSORY MINERAL NAME					
Spinel.	<1	<1	0.1–0.4	Anhedral.	Golden brown color; oxidized rims.
SECONDARY MINERAL NAME					
Serpentine.	99	REPLACING/ FILLING			
Iron oxide minerals.	1	Olivine, orthopyroxene.			Possibly some after minor clinopyroxene.
Tremolite(?).	<<1	Olivine, orthopyroxene. In thin veins.			Magnetite is oxidized.
VEIN/FRACTURE FILLING					
Serpentine ± clay minerals (smectite). Tremolite(?).	PERCENT		SIZE	ORIENTATION	
					Serpentine veins along the cracks of orthopyroxene porphyroclasts.

COMMENTS: #11

STRUCTURE

Anastomosing vein foliation defined by closely spaced sets of parallel veins is strongly to moderately developed. This thin section contains exceptional examples of the vein foliation wrapping around serpentinized orthopyroxene porphyroclasts. The isotropic mesh texture of serpentinization in relict pressure shadows is also well preserved. Orthopyroxene is replaced by bastite but relict subgrains and kinked and bent lattices can be seen. Olivine grains show mild development of subgrains with straight subgrain boundaries that are commonly oriented at a high angle to the anastomosing vein foliation.

SITE 920

153-920B-3R-1 (Piece 5, 65 cm)

Observer: ROS

Rock Name: SERPENTINIZED HARZBURGITE

Grain size: Coarse.

Texture: Porphyroclastic.

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	0	70			
Orthopyroxene.	0	30	11	Anhedral.	Elongate shape, aspect ratios range from 3:2 to 12:1.
ACCESSORY MINERAL NAME					
Spinel.	0.2	0.5	0.8	Holly leaf.	Reddish brown.
SECONDARY MINERAL NAME					
Ferrite chromite.	0.3	REPLACING/ FILLING After chromite.	0.5		Rimming or completely replacing chromite.
Iron oxide minerals.	=5	After olivine.			
Serpentine.	90-95	Olivine, orthopyroxene.	<1	Mesh textured.	Forms bastite pseudomorphs after orthopyroxene.
VEIN/FRACTURE FILLING					
Serpentine.	PERCENT 5-10		SIZE 0.5	ORIENTATION	Most are subparallel to pyroxene elongation, but one large (3 mm) vein is at a high angle to foliation.
Carbonate, iron oxide, and clay minerals.	<<1		<0.1		
Clay minerals.	<<1		<<0.1		Occurs at a high angle to foliation.

COMMENTS: #12

Staining from iron oxide minerals on many veins. Orthopyroxene serpentinized to bastite.

STRUCTURE

Serpentine texture suggests derivation from coarse-grained olivine. Serpentine network and veins exhibit beautiful evidence for extension without shear.

153-920B-3R-2 (Piece 4, 36 cm)

Observer: ROS

Rock Name: SERPENTINIZED HARZBURGITE

Grain size: Coarse.

Texture: Porphyroclastic.

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	0	70			
Orthopyroxene.	0	30	5		
ACCESSORY MINERAL NAME					
Spinel.	<1	<1	1-5	Hollyleaf.	Brownish red.
SECONDARY MINERAL NAME					
Serpentine.	PERCENT 99	REPLACING/ FILLING Olivine, orthopyroxene.	<1		Mesh texture.
Iron oxide minerals.	1	Olivine, orthopyroxene.			Lining mesh structures and veins.
VEIN/FRACTURE FILLING					
Serpentine and iron oxide minerals.	PERCENT 1		SIZE	ORIENTATION	
Talc.					
Clay minerals.					

COMMENTS: #13

STRUCTURE

Serpentine texture suggests derivation from coarse-grained (more than 1 mm) olivine. No evidence of shear deformation during or after the serpentinization.

153-920B-3R-2 (Piece 10, 98 cm)

Observer: ROS

Rock Name: SERPENTINIZED HARZBURGITE

Grain size: Coarse.

Texture: Porphyroclastic.

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	0	70			Totally replaced by serpentine.
Orthopyroxene.	5	30	8		Almost totally replaced by bastite (scattered relicts visible at high magnification).
ACCESSORY MINERAL NAME					
Spinel.	<0.1	<0.5	0.2-2.5	Holly leaf.	Mostly replaced by ferrite-chromite.
SECONDARY MINERAL NAME					
Serpentine.	PERCENT 95	REPLACING/FILLING Olivine, orthopyroxene. Chromite.	<0.1		Mesh texture.
Ferrite-chromite.	0.5				
Clay minerals.	<<1				
VEIN/FRACTURE FILLING					
Serpentine.	PERCENT		SIZE	ORIENTATION	
Iron oxide minerals-stained.					Subparallel to elongate orthopyroxene, anastomosing.
Clay minerals.					

COMMENTS: #14

STRUCTURE

Serpentine derived from a previous coarse-grained olivine. No evidence for shear movement after serpentinization.

153-920B-3R-2 (Piece 12, 122 cm)

Observer: ROS

Rock Name: SERPENTINIZED HARZBURGITE

Grain size: Coarse.

Texture: Porphyroclastic.

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	5	75	<2	Anhedral.	Kink banded.
Orthopyroxene.	5	24	2-10	Anhedral.	Crystals have elongate shapes and contain exsolution lamellae of clinopyroxene. Aspect ratio 2:1.
ACCESSORY MINERAL NAME					
Clinopyroxene.	1	1	<2.5	Anhedral.	Crystals contain exsolution lamellae of orthopyroxene. Twinning in some crystals suggests a magmatic origin.
Spinel.	<0.5	<1	0.2-1.0	Holly leaf.	Golden brown color.
Sulfide minerals.	<<1	<<1			Two sulfide minerals identified, one gray the other yellow in reflected light.
SECONDARY MINERAL NAME					
Serpentine.	PERCENT 85	REPLACING/FILLING Olivine, orthopyroxene. Olivine.	<1		Mesh textured, surrounding kernels of olivine.
Iron oxide minerals.	4		<1.5		
Chlorite.	<1		<2		
Brucite.	<1		<2		
VEIN/FRACTURE FILLING					
Serpentine and iron oxide minerals.	PERCENT		SIZE	ORIENTATION	
				4	Most are anastomosing veinlets, parallel to orthopyroxene fabric, but also occur at a high angle to orthopyroxene elongation; some with cross-fiber structure.

COMMENTS: #15

STRUCTURE

Anastomosing vein foliation defined by closely spaced sets of parallel veins is weakly to moderately developed. The vein foliation wraps around serpentinized orthopyroxene porphyroclasts and serpentinization in the relict pressure shadows is characterized by a more isotropic mesh texture. Orthopyroxene is pervasively replaced by bastite but relict subgrains and bent lattices can be seen. Olivine grains show mild development of straight subgrain boundaries.

SITE 920

153-920B-4R-1 (Piece 7, 60 cm)

Observer: ROS

Rock Name: SERPENTINIZED HARZBURGITE

Grain size: Coarse.

Texture: Porphyroclastic.

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	5	80	2.5		
Orthopyroxene.	5	20	<8	Anhedral.	Elongate shape; aspect ratio 2:1. Crystals contain exsolution of clinopyroxene.
ACCESSORY					
MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Clinopyroxene.	1	1	1-2	Anhedral.	Equant shape.
Spinel.	0.5	0.5	0.1-1.0	Holly leaf..	Brownish red.
SECONDARY					
MINERAL NAME	PERCENT PRESENT	REPLACING/ FILLING	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Serpentine.	88	Olivine, orthopyroxene.			Mesh textured.
Chlorite.	<1	Orthopyroxene.			Mostly very fine grained.
Tremolite-actinolite.	<1	Orthopyroxene.			Fibrous, radiating. Mostly very fine grained.
Talc(?).	<1	Orthopyroxene.			
Iron oxide minerals.	1				Magnetite (secondary).
VEIN/FRACTURE					
FILLING	PERCENT	PERCENT ORIGINAL	SIZE (mm)	ORIENTATION	DESCRIPTION
Serpentine.			2-3		Parallel to orthopyroxene elongation.
Brucite.			2-3		
Talc.	<1		0.5		

COMMENTS: #16

STRUCTURE

Olivine is recrystallized into polygonal grains 0.5 to 0.6 mm in size. Olivine porphyroclasts have highly disoriented subgrains. Coarse-grained, well-recovered recrystallized texture with no development of a fine-grained matrix.

153-920B-4R-1 (Piece 8, 75 cm)

Observer: HUB

Rock Name: SERPENTINIZED HARZBURGITE-LHERZOLITE AND VEIN

Grain size: Coarse.

Texture: Porphyroclastic.

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	7	70	1-2.5	Anhedral.	
Orthopyroxene.	7	20	2-8	Subhedral.	
Clinopyroxene.	4	5	1-2.5	Subhedral.	
ACCESSORY					
MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Zircon.	Trace.	Trace.	2		In crosscutting dikelet.
Apatite.	Trace.	Trace.			In crosscutting dikelet.
Spinel.	<1	<1	0.8-1.5	Holly leaf.	
SECONDARY					
MINERAL NAME	PERCENT PRESENT	REPLACING/ FILLING	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Serpentine.	30	Olivine, orthopyroxene, clinopyroxene(?).		Mesh	
Iron oxide minerals.	3	Olivine.	0.2		
Chlorite.	17	Orthopyroxene, in vein.			
Tremolite.	16	In vein.			
Clay minerals.	15	In veins.			
VEIN/FRACTURE					
FILLING	PERCENT	PERCENT ORIGINAL	SIZE (mm)	ORIENTATION	DESCRIPTION
Amphibole.			5		Replacing pyroxenes in dikelet.
Serpentine and iron oxide minerals.					
Chlorite and tremolite.	5/0				
Clay minerals.					

COMMENTS: #4L

Modes of the original assemblages are difficult to estimate because of the degree of alteration.

STRUCTURE

Anastomosing vein foliation defined by closely spaced sets of parallel veins is weakly to moderately developed. The vein foliation wraps around porphyroclasts and serpentinization in the relict pressure shadows is characterized by a more isotropic mesh texture. Veins that cut across the thick altered pyroxenite vein are folded on several scales. Basal planes of chlorite and serpentine are crudely oriented parallel to the axial surface of the folds. Orthopyroxene is moderately replaced by bastite but relict subgrains and bent lattices can be seen. Subgrains are generally equant. Olivine grains show moderate development of straight subgrain boundaries. Most grains show a strong undulose extinction. Clinopyroxene shows extensive development of subgrains with lobate and sutured boundaries.

153-920B-5R-2 (Piece 18, 112 cm)
 Rock Name: SERPENTINIZED HARZBURGITE
 Grain size: Coarse.
 Texture: Porphyroclastic.

Observer: CDW

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	0	70			
Orthopyroxene.	0	30	2-8		Completely converted to bastite (pseudomorphs with "ghost" exsolution).
ACCESSORY					
MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Spinel.	<1	<1	0.2-2	Holly leaf.	Rimmed with black ferrite-chromite.
SECONDARY					
MINERAL NAME	PERCENT PRESENT	REPLACING/ FILLING	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Serpentine.	95	Olivine and orthopyroxene.			Mesh texture after olivine and bastite pseudomorphs after orthopyroxene.
Magnetite.	4	Olivine.	0.01-0.05		Veins and stringers in serpentine.
Ferrite-chromite.	<1	After Cr-spinel.	0.02-2.0	Rims on Cr-spinel.	
VEIN/FRACTURE					
FILLING	PERCENT		SIZE	ORIENTATION	
Serpentine ± brucite.	5		0.3-0.7		

COMMENTS: #17
 STRUCTURE

Serpentine fibers in the veins are mostly vein wall-perpendicular, locally oblique (at small angles). Some orthopyroxene(?) grains show a kinked internal fabric.

153-920B-5R-3 (Piece 4A, 32 cm)
 Rock Name: SERPENTINIZED HARZBURGITE
 Grain size: Coarse.
 Texture: Porphyroclastic.

Observer: CAN

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	0	80			
Orthopyroxene.	0	19	Up to 10.		Equant to weakly elongated. Some exsolution of clinopyroxene.
ACCESSORY					
MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Clinopyroxene.	0	<1			Identification uncertain.
Spinel.	<1	<1	0.8	Anhedral.	In elongated streaks underlining original orthopyroxene foliation.
SECONDARY					
MINERAL NAME	PERCENT PRESENT	REPLACING/ FILLING	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Serpentine.	95	Olivine, orthopyroxene, clinopyroxene(?).			Mesh texture.
Iron oxide minerals.	5	Olivine, pyroxene, spinel.			
Clay minerals.	<1				
VEIN/FRACTURE					
FILLING	PERCENT		SIZE	ORIENTATION	
Serpentine ± clay minerals.			0.5-1.5		Anastomosing, parallel with spinel streaks.

COMMENTS: #5L

Serpentine fibers in anastomosing veins are usually perpendicular to vein walls.

SITE 920

153-920B-5R-3 (Piece 5, 87 cm)

Observer: PAM

Rock Name: SERPENTINIZED HARZBURGITE

Grain size: Coarse.

Texture: Porphyroclastic.

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	0	70			
Orthopyroxene.	1	30	5-8	Anhedral.	Contains exsolution of clinopyroxene.
ACCESSORY					
MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Spinel.	<<1	<<1		Anhedral.	Golden brown color.
SECONDARY					
MINERAL NAME	PERCENT PRESENT	REPLACING/ FILLING	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Serpentine.	90	Olivine, orthopyroxene.			Mesh texture.
Brucite(?)	?	Olivine, orthopyroxene.			
Iron oxide minerals.	3	Olivine, orthopyroxene.			Outlines mesh texture.
Chlorite.	6	Clinopyroxene, orthopyroxene.			Chlorite, in very minor amounts (1%) after spinel (penninite). Penninite occurs in veins also.
Clay minerals.	<1	Orthopyroxene.			
Tremolite?	Trace.	After clinopyroxene.			
Carbonate minerals.	Trace.	After clinopyroxene.			
Epidote.	Trace.	After clinopyroxene.			
VEIN/FRACTURE					
FILLING	PERCENT	PERCENT ORIGINAL	SIZE (mm)	ORIENTATION	DESCRIPTION
Serpentine and iron oxide minerals.			2		Oblique to fabric.

COMMENTS: #18
STRUCTURE

Anastomosing vein foliation defined by closely spaced sets of parallel veins is weakly to moderately developed. The vein foliation wraps around bastitic orthopyroxene porphyroclasts and serpentinization in the relict pressure shadows is characterized by a more isotropic mesh texture. A 1-mm-thick vein is found in the center of the thin section with complex fiber patterns that may be the result of a complex growth history, post-vein shearing, or both. Orthopyroxene is totally replaced by bastite, but relict subgrains and bent lattices can be seen.

153-920B-6R-1 (Piece 9, 87 cm)

Observer: CDW

Rock Name: SERPENTINIZED HARZBURGITE

Grain size: Coarse.

Texture: Porphyroclastic.

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	≈1	78	0.7-2.0		Nearly totally replaced by serpentine and magnetite.
Orthopyroxene.	2	20	1-4		Contains exsolution of clinopyroxene.
ACCESSORY					
MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Clinopyroxene.	<1	1			Occurs with relicts of olivine.
Spinel.	1	1	0.1-3.5		Brown color; oxidized on rims.
SECONDARY					
MINERAL NAME	PERCENT PRESENT	REPLACING/ FILLING	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Serpentine.	90	Olivine, orthopyroxene.			Mesh texture.
Iron oxide minerals.	5		0.01-0.3		
VEIN/FRACTURE					
FILLING	PERCENT	PERCENT ORIGINAL	SIZE (mm)	ORIENTATION	DESCRIPTION
Serpentine.			0.05-0.3		
Carbonate minerals.					

COMMENTS: #19

Fine-grained serpentine fills the veins and shows sweeping extinction parallel to the vein walls.

153-920B-6R-2 (Piece 6A, 31 cm)

Observer: CDW

Rock Name: SERPENTINIZED HARZBURGITE

Grain size: Coarse.

Texture: Porphyroclastic.

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	0	78			
Orthopyroxene.	0	22	1-6		Bastite pseudomorphs.
ACCESSORY MINERAL NAME					
Spinel.	<1	<1	0.2-2.0	Holly leaf.	Golden brown with oxidized rims.
SECONDARY MINERAL NAME					
Serpentine.	95	REPLACING/ FILLING			Mesh texture.
Iron oxide minerals.	5	Olivine, orthopyroxene.			Outlines mesh texture.
Actinolite.		Olivine, orthopyroxene.			
VEIN/FRACTURE FILLING					
Carbonate minerals.	PERCENT		SIZE	ORIENTATION	
Clay minerals.			0.05-0.5		
Serpentine and iron oxide minerals.			0.3-0.8		
Chlorite.			0.1-0.3		

COMMENTS: #20

STRUCTURE

Foliation is well defined by subparallel thin veins consisting of fibrous serpentine with the small fibers perpendicular to the length of the vein. The parallel veins are well developed adjacent to bastite grains. The orthopyroxene "pressure shadows" show an isotropic mesh serpentine texture. A thin (<1 mm) composite vein containing carbonate mineral(s) cuts the section subparallel to the foliation but also cuts relict orthopyroxene grains. Veins cutting the orthopyroxene porphyroclasts show extensional fractures, only late veins at high angle to the foliation show shear.

153-920B-6R-3 (Piece 2, 20 cm)

Observer: PAM

Rock Name: SERPENTINIZED HARZBURGITE

Grain size: Coarse.

Texture: Porphyroclastic.

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	5	82	0.1-2.0	Anhedral.	Kink banded.
Orthopyroxene.	4	15	1.5-8	Anhedral.	Bastite pseudomorphs. Contains exsolution lamellae of clinopyroxene.
ACCESSORY MINERAL NAME					
Spinel.	<1	<1	0.2-0.8	Anhedral.	Golden brown color.
Clinopyroxene.	2	3	0.1-1.0	Anhedral.	
SECONDARY MINERAL NAME					
Serpentine.	85	REPLACING/ FILLING			
Chlorite.	<1	Olivine, orthopyroxene.			
Iron oxide minerals.	4	Rimming spinel.			
Titanite (?).	Trace.	Olivine.			
Talc.	Trace.	Iron oxide minerals.			
VEIN/FRACTURE FILLING					
Serpentine and iron oxide minerals.	PERCENT		SIZE	ORIENTATION	
			1-2		

COMMENTS: #6L

STRUCTURE

Anastomosing foliation is marked by thin subparallel serpentine veins with fibers perpendicular to the long axis of the vein and associated aligned opaque minerals. The foliation wraps around relict orthopyroxene and olivine porphyroclasts. Thicker (0.3 mm) serpentine veins cut the foliation and porphyroclasts, and have no consistent orientation.

SITE 920

153-920B-7R-1 (Piece 3E, 44 cm)
 Rock Name: SERPENTINIZED HARZBURGITE
 Grain size: Coarse.
 Texture: Porphyroclastic.

Observer: KIY

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	2	83	0.1-1.5	Anhedral	
Orthopyroxene.	2	14	0.5-12.0	Anhedral.	Contains clinopyroxene exsolution.
ACCESSORY MINERAL NAME					
Clinopyroxene.	<1	2	<0.8	Anhedral.	
Spinel.	<1	1	0.1-0.8	Anhedral	Holly leaf shape. Yellowish brown color, oxidized on rims and along cracks.
SECONDARY MINERAL NAME					
Serpentine.	PERCENT	REPLACING/ FILLING			Mesh texture.
Iron oxide minerals.	87	Olivine, orthopyroxene.			With serpentine in mesh textures. Replacing rims of spine.
Chlorite.	2	Olivine, spinel.	0.01-0.3		
Tremolite.	5	Clinopyroxene, serpentine.			
	1	Pyroxene.			
VEIN/FRACTURE FILLING					
Serpentine.	PERCENT		SIZE	ORIENTATION	

COMMENTS: #21

STRUCTURE

Nearly coarse-grained equigranular texture. Some orthopyroxene grains show kinking. Irregular, branching veins are filled with fine-grained serpentine, and show sweeping extinction parallel to the vein walls.

153-920B-7R-1 (Piece 3E, 52 cm)
 Rock Name: SERPENTINIZED HARZBURGITE
 Grain size: Coarse.
 Texture: Porphyroclastic.

Observer: KIY

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	4	72	0.1-1.5	Anhedral.	
Orthopyroxene.	8	25	0.2-8.5	Anhedral.	Contains clinopyroxene exsolution.
ACCESSORY MINERAL NAME					
Clinopyroxene.	2	2	0.1-1.4	Anhedral.	
Spinel.	1	1	0.05-2.2	Anhedral.	Holly leaf.. Yellowish brown color, oxidized on rims and along cracks.
SECONDARY MINERAL NAME					
Serpentine.	PERCENT	REPLACING/ FILLING			
Iron oxide minerals.	80	Olivine, orthopyroxene.			
Tremolite.	3	Olivine.			
	2	Orthopyroxene, clinopyroxene.			
VEIN/FRACTURE FILLING					
Serpentine and iron oxide minerals +/- carbonate(?).	PERCENT		SIZE	ORIENTATION	
			0.05-0.1		

COMMENTS: #22

STRUCTURE

A foliation is defined by closely spaced sets of parallel serpentine veins that are weakly to moderately developed adjacent to the large bastite grains. The vein foliation and serpentinization away from bastites and in the relict pressure shadows is characterized by a more isotropic mesh texture. Thin (<0.2 mm) veins contain wall-perpendicular fibers.

153-920B-7R-2 (Piece 6, 64 cm) Observer: CDW
 Rock Name: SERPENTINIZED HARZBURGITE AND PYROXENITE VEIN
 Grain size: Coarse.
 Texture: Porphyroclastic.

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	0	83			Totally serpentinized.
Orthopyroxene.	0	17	1-2		Completely altered.
ACCESSORY MINERAL NAME					
Spinel.	<<1	<<1	0.05-0.5		Black to brown color.
Clinopyroxene.	<1	?	0.1-0.6	Anhedral.	
SECONDARY MINERAL NAME					
Serpentine.	PERCENT 95	REPLACING/FILLING Olivine, orthopyroxene.			Mesh texture.
Iron oxide minerals.	5	Olivine, orthopyroxene.	0.01-0.2		Lining edges of serpentine mesh structures.
Tremolite(?). Clay minerals.		In vein. In vein.			
VEIN/FRACTURE FILLING					
Altered pyroxenite vein. Clay minerals and amphibole (tremolite-actinolite).	PERCENT		SIZE 0.2-2.0	ORIENTATION	
Serpentine.					A cm-wide vein at very low angle to the foliation, with fibrous/radiating habit, olivine, magnetite, and orthopyroxene fragments. A mm-wide vein almost perpendicular to the foliation, possibly originally clinopyroxene.

COMMENTS: #23

STRUCTURE

The rock is pervasively altered, particularly within the pyroxenite vein, although trails of fresh clinopyroxene are preserved in the vein. It has associated iron oxide minerals.

153-920B-7R-2 (Piece 8, 117 cm) Observer: CDW
 Rock Name: SERPENTINIZED HARZBURGITE
 Grain size: Coarse.
 Texture: Porphyroclastic.

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	<1	83	1-2		Only small kernels left. Serpentinized.
Orthopyroxene.	≈1	17	2-6		
ACCESSORY MINERAL NAME					
Spinel.	<1	<1	0.1-1.2		Brown colored.
SECONDARY MINERAL NAME					
Serpentine.	PERCENT 96	REPLACING/FILLING Olivine, orthopyroxene.			Mesh texture.
Iron oxide minerals.	≈2		0.01-0.2		Lining mesh structures.
VEIN/FRACTURE FILLING					
Serpentine. Clay minerals.	PERCENT		SIZE 0.2-0.6	ORIENTATION	

COMMENTS: #24

STRUCTURE

Faint porphyroclastic texture. Veins are filled with nearly wall-perpendicular fibers and clay minerals. Veins mostly wrap porphyroclasts.

SITE 920

153-920B-7R-2 (Piece 9, 129 cm)

Observer: CDW

Rock Name: SERPENTINIZED HARZBURGITE

Grain size: Coarse.

Texture: Porphyroclastic.

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	0	88			
Orthopyroxene.	0	12	1-6		Completely serpentinized. Pseudomorphed by bastite.
ACCESSORY MINERAL NAME					
Spinel.	<<1	<<1	0.1-1.5		Reddish brown.
SECONDARY MINERAL NAME	PERCENT	REPLACING/ FILLING			
Serpentine.	95	Olivine, orthopyroxene.			Mesh texture.
Iron oxide minerals.	5		0.01-0.2		Lining serpentine mesh structures.
VEIN/FRACTURE FILLING	PERCENT		SIZE	ORIENTATION	
Serpentine.			0.2-0.4		
Clay minerals.					

COMMENTS: #25
STRUCTURE

Faint porphyroclastic texture. Vein foliation wraps around the porphyroclasts. Irregular veins are filled with wall-perpendicular serpentine and clay minerals.

153-920B-7R-3 (Piece 1, 15 cm)

Observer: NOR

Rock Name: SERPENTINIZED HARZBURGITE

Grain size: Coarse.

Texture: Porphyroclastic.

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	2	67	<1	Anhedral.	Fresh crystals are associated with clinopyroxene or are relict in serpentine mesh structures. No kink banding observed.
Orthopyroxene.	<1	30	1-8	Anhedral.	
ACCESSORY MINERAL NAME					
Clinopyroxene.	1	3	0.2-4	Anhedral.	Contains thin exsolution lamellae.
Spinel.	<1	<1	0.3-1	Anhedral.	Golden brown color.
Iron oxide minerals.	<1	<1	0.1-0.2	Anhedral.	Opagues; (probably oxidized spinel).
SECONDARY MINERAL NAME	PERCENT	REPLACING/ FILLING			
Serpentine.	80	Olivine, orthopyroxene.			Mesh structure.
Iron oxide minerals.	5	Olivine.	<0.05	Anhedral.	Outlines serpentine mesh structure and along cleavages of pyroxene.
Clay minerals.	5	Clinopyroxene.			Along pyroxene cleavages; associated with serpentine.
Talc.					Fibrous; associated with serpentine mesh structures.
VEIN/FRACTURE FILLING	PERCENT		SIZE	ORIENTATION	
Serpentine, iron oxide minerals, clay, and talc.					

COMMENTS: #26
STRUCTURE

A weak anastomosing foliation is defined by thin subparallel serpentine veins with fibers perpendicular to the long axis of the vein and associated aligned opaque minerals. The foliation wraps completely altered orthopyroxene and olivine porphyroclasts.

153-920B-7R-3 (Piece 6, 67 cm)

Observer: NOR

Rock Name: SERPENTINIZED HARZBURGITE

Grain size: Coarse.

Texture: Porphyroclastic.

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	7	70	0.4-2	Anhedral.	Occurs in fresh patches with orthopyroxene and clinopyroxene. No pleochroism. Contains clinopyroxene exsolution.
Orthopyroxene.	3	25	1-8	Anhedral.	

ACCESSORY MINERAL NAME

Clinopyroxene.	2	5	0.4-2	Anhedral.	Contains exsolution lamellae.
Spinel.	<1	<1	0.4-1.2	Anhedral.	Brown color.

SECONDARY MINERAL NAME

SECONDARY MINERAL NAME	PERCENT	REPLACING/ FILLING			
Serpentine.	82	Olivine, orthopyroxene.			Mesh texture.
Iron oxide minerals.	5	Olivine.			Outlines mesh structures.
Chlorite.	<1				
Tremolite.	<1				
Clay minerals.	<1				
Apatite.	Trace.				
Talc.	Trace.				

VEIN/FRACTURE

FILLING	PERCENT	SIZE	ORIENTATION
Serpentine, talc, and clay minerals.			
Serpentine.			
Clay minerals.			
Chlorite, tremolite, clay minerals, and an unidentified mineral.			

COMMENTS: #27

The thin section contains a 3-mm-wide vein filled with chlorite and apatite, but also retains a patch of relatively unaltered peridotite.

STRUCTURE

At least three vein sets cut this section. A straight tremolite, chlorite, and clay mineral-filled vein is cut by serpentine and clay veins and relatively pure fibrous serpentine veins. The serpentine veins apparently cut the serpentine and clay mineral veins, though the two sets are subparallel. Serpentine fibers are generally perpendicular to vein walls though in the widest veins, curved fibers are present. Relict orthopyroxene and olivine show undulose extinction.

153-920B-7R-3 (Piece 6, 71 cm)

Observer: CDW

Rock Name: SERPENTINIZED HARZBURGITE WITH GABBRO VEIN

Grain size: Coarse.

Texture: Porphyroclastic.

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	<1	73			
Orthopyroxene.	0	13			

ACCESSORY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Clinopyroxene.	<1	8	0.5-1.5	Anhedral.	
Spinel.	6	6	0.2-3	Brownish black.	Large opaque spinels occur in the vein.

SECONDARY MINERAL NAME

SECONDARY MINERAL NAME	PERCENT	REPLACING/ FILLING			
Serpentine.	88	Olivine, orthopyroxene.			Mesh texture.
Iron oxide minerals.	5	0.01-0.4			Outlining serpentine mesh structures.
Chlorite.		In vein.			
Clay minerals.		In vein.			
Actinolite/tremolite.					Fibrous.
Brown amphibole.		Rimming colorless amphibole.			

VEIN/FRACTURE

FILLING	PERCENT	SIZE	ORIENTATION
Serpentine.		0.3-2.5	
Chlorite, amphibole, clay and iron oxide minerals.		2	

COMMENTS: #28

The section includes a 2-cm-wide vein of chlorite, amphibole, clay minerals, and mm-sized magnetite grains. At least 50% of the section is vein-filling materials.

STRUCTURE

Veins of serpentine and serpentine, clay minerals, and an unidentified mineral cut the main, coarse-grained, wide (12 mm) vein. The cutting veins are thickest (up to 2 mm) in the center of the coarse-grained vein and taper to less than 0.3 mm away from it. Serpentine fibers in the later veins are generally oriented perpendicular to the long axis of the vein but some fibers are curved in the thickest veins showing both sinistral and dextral sense of curvature.

SITE 920

153-920B-8R-1 (Piece 1, 0 cm)
 Rock Name: AMPHIBOLE VEIN
 Grain size: Coarse.

Observer: CAN

SECONDARY MINERAL NAME	PERCENT	REPLACING/ FILLING	SIZE	MORPHOLOGY	DESCRIPTION
Amphibole.	50		0.4–10	Euhedral. Flakes.	Replaces earlier mafic mineral, 10–20 mm width, were possibly clinopyroxene. Fills interstices between amphiboles.
Chlorite.	10				
Clay minerals.	20	Amphibole.			
Zeolites.	20				Small spheroids.

VEIN/FRACTURE FILLING	PERCENT	SIZE	ORIENTATION	DESCRIPTION
Amphibole.		1		Deformed. Cuts zeolites(?).
Carbonate minerals.		1		Undeformed.

COMMENTS: #7L
 STRUCTURE

Thin vein was possibly a clinopyroxene-bearing amphibolitic vein originally, but there are no relics of this mineral assemblage. There is limited deformation, but no preferred orientation.

153-920B-8R-2 (Piece 6, 70 cm)
 Rock Name: SERPENTINIZED HARZBURGITE
 Grain size: Coarse.
 Texture: Porphyroclastic.

Observer: PAM

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	2	70	0.5–1.5	Anhedral.	
Orthopyroxene.	2	30	1–5	Anhedral.	Contains exsolution of clinopyroxene(?).

ACCESSORY MINERAL NAME	PERCENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Clinopyroxene.	Trace.	?		Anhedral.	Associated with larger orthopyroxene crystals.
Spinel.	Trace.	Trace.	0.3–1.2	Anhedral.	Reddish-brown color, oxidized at rims and along cracks.

SECONDARY MINERAL NAME	PERCENT	REPLACING/ FILLING	DESCRIPTION
Serpentine.	91	Olivine, orthopyroxene.	Mesh texture; cross-fiber veins.
Iron oxide minerals.	5	Olivine, orthopyroxene.	
Chlorite.	Trace.	Orthopyroxene.	
Unidentified.	Trace.		Birefringent (talc?, amphibole?).
Talc.			

VEIN/FRACTURE FILLING	PERCENT	SIZE	ORIENTATION	DESCRIPTION
Serpentine and iron oxide minerals.				

COMMENTS: #8L
 STRUCTURE

Veins (aligned elongate trails) of opaque minerals in a serpentine network form an anastomosing foliation that wraps around relict orthopyroxene grains. This fabric is cut by thin (<0.1 to 0.3 mm) fibrous serpentine veins. This subparallel set of veins also cuts the relict pyroxene.

153-920B-8R-3 (Piece 11, 115 cm)
 Rock Name: SERPENTINIZED HARZBURGITE
 Grain size: Medium-coarse.
 Texture: Porphyroclastic.

Observer: NOR

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	1	78			Relict in serpentine mesh structures.
Orthopyroxene.	2	20	1-4	Anhedral.	Some orthopyroxenes have recrystallized into smaller grains, associated with spinel, some of which show symplectite intergrowth between these two phases.

ACCESSORY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Clinopyroxene.	<<1	2	0.01	Anhedral.	One small crystal observed.
Spinel.	<1	<1	0.01-0.05	Anhedral.	Yellowish brown color.

SECONDARY MINERAL NAME	PERCENT	REPLACING/FILLING	DESCRIPTION
Serpentine.	90	Olivine, orthopyroxene.	Mesh textures with iron oxide minerals.
Iron oxide minerals.	6	Olivine.	
Tremolite.	<<1	Orthopyroxene.	
Talc.	<1	Olivine, orthopyroxene.	

VEIN/FRACTURE FILLING	PERCENT	SIZE	ORIENTATION	DESCRIPTION
Serpentine.		0.2-0.7		Fibrous.

COMMENTS: #9L
 STRUCTURE

A set of parallel, thin (0.2 to 0.7 mm), fibrous serpentine veins cut the serpentine-opaque mineral mesh alteration texture and, to a lesser extent, relict orthopyroxene. Orthopyroxene grains that have apparently recrystallized from larger grains show undulatory extinction.

153-920B-8R-4 (Piece 4, 46 cm)
 Rock Name: SERPENTINIZED HARZBURGITE
 Grain size: Coarse.
 Texture: Porphyroclastic.

Observer: GEO

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	6	85	0.1-3.0	Anhedral.	
Orthopyroxene.	6	12	0.2-3.0	Anhedral.	

ACCESSORY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Spinel.	<1	<1	0.05-2.3	Anhedral.	Yellowish brown.
Clinopyroxene.	1	2	0.1-2.2	Anhedral.	

SECONDARY MINERAL NAME	PERCENT	REPLACING/FILLING	DESCRIPTION
Serpentine.	91	Olivine, orthopyroxene.	
Magnetite.	2	Olivine.	
Chlorite.	10	Clinopyroxene, serpentine.	
Tremolite.	3		

VEIN/FRACTURE FILLING	PERCENT	SIZE	ORIENTATION	DESCRIPTION
Chlorite and tremolite.				
Chlorite and serpentine.				

COMMENTS: #10L
 STRUCTURE

Thin discontinuous veins have wall-perpendicular fibers. Thick chlorite and serpentine vein shows some shearing along its outer walls. Short, irregular veins perpendicular to thick chlorite and serpentine veins are filled with granular serpentine, which is very fine grained along the walls and coarse grained in the center.

SITE 920

153-920B-8R-4 (Piece 11, 115 cm)

Observer: KIY

Rock Name: SERPENTINIZED HARZBURGITE

Grain size: Medium-coarse.

Texture: Porphyroclastic.

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	11	75	0.1-4.5	Anhedral.	
Orthopyroxene.	8	20	0.2-4.0	Anhedral.	
ACCESSORY					
MINERAL NAME					
Clinopyroxene.	2	4	0.1-2.2	Anhedral.	
Spinel.	1	1	<0.2	Anhedral.	Holly leaf. Yellowish-brown color.
SECONDARY					
MINERAL NAME	PERCENT	REPLACING/ FILLING			
Serpentine.	73	Olivine, orthopyroxene.			
Iron oxide minerals.	5	Olivine.			
Chlorite.		In veins.			
Talc.		In veins.			
Tremolite.		In veins.			
VEIN/FRACTURE					
FILLING	PERCENT	SIZE	ORIENTATION		
Serpentine and amphibole.					These veins exhibit evidence of shear.
Serpentine, chlorite, talc, ± iron oxide and sulfide minerals.					Shows syntaxial overgrowths.

COMMENTS: #29

STRUCTURE

Olivine commonly has a coarse-grained texture (about 4 mm) with almost no subgrain development. Grains have an irregular shape and grain boundaries have triple junctions. Also, found as 0.5 to 1 mm long recrystallized grains with straight, high-angle subgrain boundaries. Orthopyroxene occurs as large (5-6 mm) grains that show weakly developed undulatory extinction and lattice bending. Grain margins are cusped/lobate and irregular grain margins are intergrown with clinopyroxene and olivine. Clinopyroxene is commonly found around margins of orthopyroxene, and less commonly occurs as isolated grains totally surrounded by olivine. No subgrain development is present but all grains show undulose extinction. A vein cuts thin section filled with chlorite and actinolite. This thick vein shows some evidence of weak wall-parallel shear after emplacement of vein filling minerals.

153-920B-9R-1 (Piece 8, 79 cm)

Observer: PAM

Rock Name: SERPENTINIZED HARZBURGITE WITH VEIN

Grain size: Medium-coarse.

Texture: Porphyroclastic.

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	2	85	0.5-1.5	Anhedral.	
Orthopyroxene.	1	15	1-4.5	Anhedral.	Bastite pseudomorphs.
ACCESSORY					
MINERAL NAME					
Clinopyroxene.	<1	?	2	Anhedral.	
Spinel.	<1	<1	0.2-1.5	Anhedral.	Reddish-brown color, oxidized rims and cracks.
SECONDARY					
MINERAL NAME	PERCENT	REPLACING/ FILLING			
Serpentine.	92	Olivine, orthopyroxene.			Mesh texture. Bastite after orthopyroxene.
Amphibole (?).		In vein.			Fibrous habit.
Iron oxide minerals.	5	Olivine, orthopyroxene.			In mesh texture with serpentine.
Chlorite.	Trace.	After spinel.			
Magnetite.	Trace.	After spinel.			
VEIN/FRACTURE					
FILLING	PERCENT	SIZE	ORIENTATION		
Serpentine, chlorite, amphibole, and talc.		10			Sheared.
Serpentine.		<0.2			
Clay minerals.		<0.1			

COMMENTS: #30

Modal estimates exclude vein minerals. Proportions of clinopyroxene and orthopyroxene difficult to estimate due to degree of alteration.

STRUCTURE

Olivine occurs as equant grains with triple junction grain boundaries. Some grains show development of subgrains with straight low-angle boundaries. Orthopyroxene, pseudomorphed by bastite, is up to 4 mm in size. Relict subgrains are preserved in the bastites. Many bastites have kinks.

153-920B-9R-2 (Piece 3B, 36 cm)
 Rock Name: SERPENTINIZED HARZBURGITE
 Grain size: Coarse.
 Texture: Porphyroclastic.

Observer: KIY

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	<1	85			
Orthopyroxene.	2	12	0.3-12.0	Anhedral.	
ACCESSORY					
MINERAL NAME					
Clinopyroxene.	<1	2	<0.1	Anhedral.	Occurs only as exsolution lamellae in orthopyroxene.
Spinel.	<1	1	0.05-1.2	Anhedral.	Yellowish-brown color.
SECONDARY					
MINERAL NAME	PERCENT	REPLACING/ FILLING			
Talc.	3				With serpentine in mesh structures.
Iron oxide minerals.	2	Olivine.			
Serpentine.	85	Olivine, orthopyroxene.			
Chlorite.	5	Serpentine.			
Tremolite.					
VEIN/FRACTURE					
FILLING	PERCENT		SIZE	ORIENTATION	
Serpentine and iron oxide and clay minerals.					

COMMENTS: #11L
 STRUCTURE
 Weakly developed anisotropic serpentinization in former olivine matrix. Bastitic orthopyroxene shows lattice kinks and broad warps. Weak subgrain development also noted.

153-920B-9R-2 (Piece 4C, 84 cm)
 Rock Name: SERPENTINIZED HARZBURGITE
 Grain size: Coarse.
 Texture: Porphyroclastic.

Observer: CDW

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	0	87			
Orthopyroxene.	0	13			
ACCESSORY					
MINERAL NAME					
Spinel.	<1	<1	0.1-0.8	Anhedral.	Black.
SECONDARY					
MINERAL NAME	PERCENT	REPLACING/ FILLING			
Serpentine.	98	Olivine, orthopyroxene.			Mesh texture.
Iron oxide minerals.	2	Olivine, orthopyroxene	0.01-0.3		Outlining serpentine mesh structures.
VEIN/FRACTURE					
FILLING	PERCENT		SIZE	ORIENTATION	
Serpentine and iron oxide iron oxide minerals.			0.1-0.2		

COMMENTS: #12L
 The thin section was badly plucked during preparation.
 STRUCTURE
 Anastomosing vein foliation moderately developed. Mesh textured serpentine occurs along the pressure shadow margins. Orthopyroxene altered to bastite.

SITE 920

153-920B-9R-3 (Piece 2, 9 cm)

Observer: CDW

Rock Name: SERPENTINIZED HARZBURGITE

Grain size: Coarse.

Texture: Porphyroclastic.

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	0	85			
Orthopyroxene.	0	15	2-5		
ACCESSORY MINERAL NAME					
Spinel.	<1	<1	0.05-0.8	Anhedral.	Brown to black in color.
SECONDARY MINERAL NAME					
Iron oxide minerals.	PERCENT	REPLACING/ FILLING			
Serpentine.	2	Olivine.			Within serpentine mesh structures.
Chlorite.	98	Olivine, orthopyroxene.			Mesh texture.
	Trace.	Serpentine.			
VEIN/FRACTURE FILLING					
Serpentine.	PERCENT		SIZE	ORIENTATION	
Serpentine and iron oxide and sulfide minerals.			0.8-2.0		

COMMENTS: #31

STRUCTURE

Well-developed meshwork in serpentine. Large bastite with straight cleavages and poorly developed recrystallization.

153-920B-10R-1 (Piece 2A, 17 cm)

Observer: JFC

Rock Name: SERPENTINIZED HARZBURGITE

Grain size: Coarse.

Texture: Porphyroclastic.

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	0	72			
Orthopyroxene.	0	25	1.2-6		Highly strained.
ACCESSORY MINERAL NAME					
Clinopyroxene.	0	2	1-2	Anhedral.	
Spinel.	0.4	0.8	0.5-1.0	Elongate, anhedral.	Yellow brown color.
SECONDARY MINERAL NAME					
Serpentine.	PERCENT	REPLACING/ FILLING			
Bastite.	70	Olivine.			
Iron oxide minerals.	25	Orthopyroxene.			
Chlorite + magnetite	4	Olivine.			
Amphibole.		Spinel.			
		Bastite.			
VEIN/FRACTURE FILLING					
Serpentine.	PERCENT		SIZE	ORIENTATION	
			0.2-0.4		Cross-fiber veins, parallel and oblique to foliation.

COMMENTS: #13L

This rock is completely altered; there are no primary mineral phases remaining.

STRUCTURE

The bastites show strongly bent cleavages. Well-developed anastomosing vein foliation except in pressure shadows of large bastites where random mesh-textured serpentine occurs.

153-920B-10R-1 (Piece 8, 88 cm)

Observer: CAN

Rock Name: AMPHIBOLE VEIN

Grain size:

Texture:

SECONDARY MINERAL NAME	PERCENT	REPLACING/ FILLING		
Amphibole.	60		Euhedral.	
Chlorite.	20		Flakes.	Fills interstices between amphiboles.
Clay minerals.	15			
Zeolites.	5			

VEIN/FRACTURE FILLING	PERCENT	SIZE	ORIENTATION	
Carbonate minerals.		1		Slightly deformed.
Clay minerals or chlorite.		1		Slightly deformed.
Amphibole.				

COMMENTS: #33

STRUCTURE

Amphiboles may have replaced earlier pyroxene. In one half of thin section, chlorite pseudomorphs pyroxene. Slight deformation with a preferred ORIENTATION.

153-920B-10R-3 (Piece 1, 0 cm)

Observer: PAM

Rock Name: META-CLINOPYROXENITE

Grain size: Coarse.

Texture: Equigranular.

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Clinopyroxene.	50	100	4-7	Anhedral.	Crystals show some twinning, kink bands and recrystallization.

ACCESSORY

MINERAL NAME					
Spinel.	Trace	Trace			
Olivine.	Trace.	Trace.		Subhedral.	Totally altered.

SECONDARY MINERAL NAME	PERCENT	REPLACING/ FILLING		
Chlorite.	8	Clinopyroxene.		
Clay minerals.	12	Clinopyroxene and in veins.		"Spherulitic"
Actinolite.	11	Clinopyroxene and in veins.		Fibrous, radiating habit.
Zeolites.	13	Clinopyroxene.		"Spherulitic"
Carbonate minerals.	6	In veins.		

VEIN/FRACTURE FILLING	PERCENT	SIZE	ORIENTATION	
Carbonate minerals.				
Zeolites and clay minerals.				
Actinolite.				

COMMENTS: # 34

The sample is pervasively altered; the percentage of secondary minerals within the veins vs. those not in veins is difficult to assess, so all have been combined under secondary minerals. Olivine may have been present originally; two equant, totally altered grains are enclosed in a relatively unaltered pyroxene.

SITE 920

153-920B-10R-4 (Piece 9, 139 cm)

Observer: PAM

Rock Name: SERPENTINIZED HARZBURGITE

Grain size: Coarse.

Texture: Porphyroclastic.

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	2	84	<2	Anhedral.	
Orthopyroxene.	10	14	4-6	Anhedral.	Contains exsolution of clinopyroxene; aspect ratio 1:1.
ACCESSORY					
MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Spinel.	<1	<1	<1	Anhedral.	Reddish brown color.
Clinopyroxene.	<1	2	0.5-1.0	Anhedral.	Usually only preserved adjacent to large orthopyroxene crystals.
SECONDARY					
MINERAL NAME	PERCENT PRESENT	REPLACING/ FILLING	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Serpentine.	87	Olivine, orthopyroxene.			Mesh texture; bastite pseudomorphs.
Iron oxide minerals.	1	Olivine, orthopyroxene.			
Chlorite.	Trace.				
Unidentified mineral.	Trace.				Fibrous habit, lower first order birefringence, radial extinction.
Talc.	<1				
VEIN/FRACTURE					
FILLING	PERCENT	PERCENT ORIGINAL	SIZE (mm)	ORIENTATION	DESCRIPTION
Serpentine.			<0.5		Cross-fiber in some cases.

COMMENTS: #35
STRUCTURE

Bastite shows bent and kinked lattices, and in some grains, strong subgrain development. Olivine shows weak subgrain development. Anastomosing vein fabric is weakly developed to nonexistent.

153-920B-11R-1 (Piece 8B, 54 cm)

Observer: PAM

Rock Name: SERPENTINIZED HARZBURGITE

Grain size: Coarse.

Texture: Porphyroclastic.

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	4	75	0.02-2.0	Anhedral.	
Orthopyroxene.	15	20	3-9	Anhedral.	Contains exsolution of clinopyroxene; aspect ratio 2:1.
ACCESSORY					
MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Clinopyroxene.	1	4	0.5-2.0	Anhedral.	
Spinel.	<1	<1	<1	Anhedral.	Some spinels are cracked and crosscut by thin parallel veins of serpentine.
SECONDARY					
MINERAL NAME	PERCENT PRESENT	REPLACING/ FILLING	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Serpentine.	79	Olivine, orthopyroxene.			Mesh texture, bastite pseudomorphs.
Iron oxide minerals.	1	Olivine.			Outlines serpentine mesh structures.
Smectite(?)	Trace.				
Talc.	Trace.	Olivine, orthopyroxene.			
Chlorite.	Trace.	Orthopyroxene (?).			
VEIN/FRACTURE					
FILLING	PERCENT	PERCENT ORIGINAL	SIZE (mm)	ORIENTATION	DESCRIPTION
Serpentine.			0.3		Cross fiber.

COMMENTS: #36
STRUCTURE

Anastomosing vein foliation is well developed. Veins in this fabric are composed of serpentine with fibers perpendicular to vein walls and magnetite seams. Thicker veins are oriented parallel and perpendicular to the foliation. Olivine grains contain straight subgrain boundaries oriented at a high angle to foliation and lean in a sinistral sense in two areas. Orthopyroxene cleavage planes are bent and weakly kinked when oriented obliquely to foliation. Round subgrains develop at contacts between two orthopyroxene grains. No strong asymmetry to porphyroclasts is seen. Clinopyroxene exhibits round, anhedral subgrains. Spinel grains are elongate but generally oriented at a high angle to the foliation.

153-920B-11R-1 (Piece 14, 119 cm)

Observer: JFC

Rock Name: SERPENTINIZED HARZBURGITE

Grain size: Coarse.

Texture: Porphyroclastic.

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	8	81	0.6-2.0	Anhedral.	Subrounded grains are not highly strained, elongate grains are highly strained.
Orthopyroxene.	5	14	2-2.5	Anhedral.	Elongate to subrounded.
Clinopyroxene.	4	5	1.2-3	Anhedral.	Subrounded.
ACCESSORY MINERAL NAME					
Spinel.	0.6	0.6	0.5-1	Holly leaf.	Yellow brown.
SECONDARY MINERAL NAME					
Serpentine.	70	REPLACING/ FILLING Olivine.			
Serpentine (bastite)	10	Orthopyroxene.			
Magnetite.					
VEIN/FRACTURE FILLING					
Serpentine.	PERCENT		SIZE	ORIENTATION	
			0.1		Parallel to foliation.

COMMENTS: #14L

The clinopyroxene content is relatively high compared to other portions of the core.

STRUCTURE

Anastomosing foliation is well developed but is not apparently overgrowing any previous fabric. Instead it seems to overgrow straight, through-going tensile cracks. Olivine occurs as large (up to 10 mm) grains that do not show much recrystallization and other domains that are extensively recrystallized. Grain size in recrystallized region ranges from 1 mm to 0.1 mm. Grain boundaries form triple junctions and have rounded lobate shapes. Local development of undulose extinction. Orthopyroxene shows microstructures that are similar to olivine. Clinopyroxene is found with recrystallized orthopyroxene and isolated in the fine recrystallized matrix with olivine.

153-920B-11R-2 (Piece 1, 18 cm)

Observer: JMF

Rock Name: SERPENTINIZED HARZBURGITE

Grain size: Coarse.

Texture: Porphyroclastic.

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	8	82	0.2-1	Anhedral	
Orthopyroxene.	10	15	1-7	Anhedral.	
ACCESSORY MINERAL NAME					
Clinopyroxene.	<1	1	1	Anhedral.	
Spinel.	1-2	1-2	0.5-1.5	Anhedral.	Medium golden-brown colored.
SECONDARY MINERAL NAME					
Serpentine.	75	REPLACING/ FILLING Olivine, clinopyroxene/ veins	0.1-10		Fibrous, massive.
Magnetite.	2	Olivine, spinel/veins.			
Chlorite.	2	Orthopyroxene.			
VEIN/FRACTURE FILLING					
Serpentine.	PERCENT		SIZE	ORIENTATION	
	95		0.1-1		See comments.
Magnetite.	5				See comments.

COMMENTS: #37

Anastomosing vein foliation is well developed. Veins in this fabric are composed of serpentine with fibers perpendicular to vein walls and magnetite seams. Thicker veins are oriented parallel to the foliation. Olivine subgrains are relatively equant and have only a few subgrain boundaries. Orthopyroxene cleavage planes are bent and grains show sweeping undulose extinction. Round subgrains develop at contacts between two orthopyroxene grains. No strong asymmetry to porphyroclasts is seen. Clinopyroxene occurs as round anhedral subgrains. Spinel grain orientations show little systematic relationship to the foliation.

153-920B-11R-2 (Piece 16, 119 cm)

Rock Name: SERPENTINIZED HARZBURGITE

Grain size: Coarse.

Texture: Porphyroclastic.

Observer: KIY

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	60	77	0.2–8.5	Anhedral.	
Orthopyroxene.	10	16	0.2–7.5	Anhedral.	Contains exsolution of clinopyroxene.
ACCESSORY					
MINERAL NAME					
Clinopyroxene.	3	4	0.2–3.8	Anhedral.	
Spinel.	1	1	<0.2	Subhedral to anhedral.	Dark brown color.
Plagioclase.	1	1	<0.3	Anhedral.	Occurs interstitially in association with amphibole and spinel.
Ti-pargasite.	1	1	<0.4	Anhedral.	Occurs interstitially in association with plagioclase and spinel; also replacing clinopyroxene and orthopyroxene and sometimes as overgrowths on pyroxene.
SECONDARY					
MINERAL NAME					
Chlorite.	11	REPLACING/ FILLING			Clinopyroxene, bastite.
Serpentine.	10				Olivine, orthopyroxene.
Iron oxide minerals.	2				Olivine.
Tremolite.	1				
Clay minerals.					
VEIN/FRACTURE					
FILLING					
Serpentine ± iron oxide and sulfide minerals.	PERCENT		SIZE	ORIENTATION	
			1–4		

COMMENTS: #38

Orthopyroxene adjacent to the vein has euhedral termination. Some clinopyroxene has magmatic growth twins with euhedral terminations and zoning at rims. Clinopyroxene rims some orthopyroxene. The section contains one very large sulfide mineral grain (3 mm x 1 mm). Plagioclase + Ti-pargasite + spinel occur interstitially in association with and as overgrowths on clinopyroxene and orthopyroxene.

153-920B-12R-1 (Piece 4, 117 cm)

Rock Name: SERPENTINIZED HARZBURGITE

Grain size: Coarse.

Texture: Porphyroclastic.

Observer: KIY

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	8	84	0.1–2.0	Anhedral.	
Orthopyroxene.	2	10	0.2–6.5	Anhedral.	
ACCESSORY					
MINERAL NAME					
Clinopyroxene.	1	2	0.1–0.4	Anhedral.	
Spinel.	2	4	0.05–2.2	Anhedral.	Holly leaf. Reddish brown color. Reported clinopyroxene inclusions.
SECONDARY					
MINERAL NAME					
Serpentine.	PERCENT 82	REPLACING/ FILLING			Olivine, orthopyroxene.
Iron oxide minerals.	3		<0.1–5	Fibrous, massive.	Olivine, spinel.
Chlorite.	2				Clinopyroxene, bastite after orthopyroxene.
VEIN/FRACTURE					
FILLING					
Serpentine.	PERCENT 95		SIZE 0.1–1	ORIENTATION	See comments.
Magnetite.	5		0.1–1		See comments.

COMMENTS: #39

This section has an unusually large abundance of spinel, commonly in trails.

STRUCTURE

Anastomosing vein foliation has domains of intensely developed vein foliation alternating with domains of poorly developed vein foliation. In the well-developed domains, veins are composed of serpentine with fibers perpendicular to vein walls and magnetite seams. Thicker veins are oriented parallel and perpendicular to the foliation. Veins perpendicular to foliation are weakly sheared and show no cross fibers. Olivine grains contain subgrains with straight low-angle boundaries. Subgrains are oriented at a high angle to foliation. Most grains go extinct when stage is at a low angle to the foliation suggesting a preferred lattice fabric. Orthopyroxene shows significant subgrain development and grain-size reduction. Dextral asymmetry in one porphyroclasts is seen. Spinel grains are generally found along crude horizons parallel to the foliation.

153-920B-12R-1 (Piece 5, 128 cm)
 Rock Name: SERPENTINIZED DUNITE
 Grain size: Coarse.
 Texture: Equigranular.

Observer: CAN

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	0	97			
ACCESSORY MINERAL NAME					
Spinel.	1	1	0.2–1.5	Anhedral.	Black/opaque.
Orthopyroxene.	0	2	0.4–1.0	Anhedral.	Occasionally looks like serpentine replaced pyroxene but does not form true bastite textures.
SECONDARY MINERAL NAME					
Serpentine.	PERCENT 95	REPLACING/FILLING Olivine.			Mesh texture.
Iron oxide minerals.	5	Olivine, spinel	0.01–0.1		Disseminated.
VEIN/FRACTURE FILLING					
Serpentine and magnetite.	PERCENT 97		SIZE 0.1–1	ORIENTATION	Occurs as a fine net of thin veins that enhance the anastomosing foliation.
Magnetite.	3		0.1–1		Occurs as a fine net of thin veins that enhance the anastomosing foliation.

COMMENTS: #40

STRUCTURE

Anastomosing vein foliation has domains of intensely developed vein foliation that alternate with domains of poorly developed vein foliation. In the well-developed domains, veins are composed of serpentine with fibers perpendicular to vein walls and magnetite seams. Thicker veins are oriented parallel and perpendicular to the foliation. In veins perpendicular to the foliation, fibers are commonly oblique to the vein walls. Fibers in these veins show both sinistral and dextral obliquity. Replaced porphyroclasts are highly elongate (lengths beyond dimensions of thin section) with no recognizable asymmetry.

153-920B-12R-2 (Piece 6A, 132 cm)
 Rock Name: SERPENTINIZED DUNITE
 Grain size: Medium.
 Texture: Equigranular.

Observer: CAN

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	0	96			
ACCESSORY MINERAL NAME					
Spinel.	<1	2	0.1–0.8	Anhedral.	Black/opaque.
Orthopyroxene.	0	2	1–2.5	Anhedral.	
SECONDARY MINERAL NAME					
Serpentine.	PERCENT 96	REPLACING/FILLING Olivine.			Mesh texture.
Magnetite.	4	Olivine, spinel.	0.01		
VEIN/FRACTURE FILLING					
Serpentine.	PERCENT		SIZE 0.5	ORIENTATION	Oblique to minute serpentine + magnetite seams of anastomosing fabric.

COMMENTS: #41

STRUCTURE

A weak anastomosing foliation marked by thin serpentine and magnetite veins is at a 40° angle to the trace of spinel foliation. Anastomosing vein foliation is moderately to weakly developed. Preferred orientation of fibers in veins only weakly developed. Thicker veins are oriented parallel and at a high angle (60°) to the foliation. The high-angle set leans in a dextral sense and fibers are commonly oblique to the vein walls. Fibers in these veins show both sinistral and dextral obliquity. Spinel grains are weakly elongate and lie at a high angle to the foliation.

SITE 920

153-920B-12R-2 (Piece 6, 139 cm)
 Rock Name: SERPENTINIZED DUNITE
 Grain size: Medium.
 Texture: Equigranular.

Observer: CAN

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	0	96	?	?	
Spinel.	1	3-4	0.2-0.8	Anhedral.	
SECONDARY MINERAL NAME	PERCENT	REPLACING/ FILLING			
Serpentine.	94	Olivine/veins.		Fibrous.	See comments.
Magnetite.	5	Olivine spinel.			
VEIN/FRACTURE FILLING	PERCENT		SIZE	ORIENTATION	
Serpentine.	95		0.1-0.5		See comments.
Magnetite.	5		0.1-0.5		See comments.

COMMENTS: #42
 STRUCTURE

Anastomosing vein foliation is weakly developed. Slide is dominated by mesh network of serpentine with two vein sets. One set is typically thicker and the acute angle between the sets is 20°-30°. Fibers are generally perpendicular to vein walls. Thicker set shows complex crack-seal history.

153-920B-12R-5 (Piece 1A, 10 cm)
 Rock Name: SERPENTINIZED HARZBURGITE
 Grain size: Coarse.
 Texture: Porphyroclastic.

Observer: ROS

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	8	70	0.5-1.5		
Orthopyroxene.	10	25	2-8		Slightly elongated. 1.2-1.8 aspect ratios, clinopyroxene exsolution.
ACCESSORY MINERAL NAME					
Cr-spinel.	<1	<1	0.2-2		
Clinopyroxene.	3.5	4	0.2-1		Recrystallized.
SECONDARY MINERAL NAME	PERCENT	REPLACING/ FILLING			
Serpentine.	73	Olivine.			Mesh textured.
Ferrite chromite.	0.5	Spinel.			Rimming or entirely replacing spinel (black rims).
Iron oxide minerals.	4	Olivine.			In serpentine veins.
Amphibole.	0.5				
Chlorite.	0.5				
VEIN/FRACTURE FILLING	PERCENT		SIZE	ORIENTATION	
Serpentine.			0.1-0.5		
Clay minerals.					

COMMENTS: #15L
 STRUCTURE

Basaltic pyroxene shows bent lattice and relics of subgrain development and recrystallization of former orthopyroxene. The anastomosing vein foliation is variably developed, nonexistent in some domains, strongly developed in others. Clinopyroxene shows bent lattices and strong dynamic recrystallization.

153-920B-12R-5 (Piece 1B, 56 cm)

Observer: LAG

Rock Name: SERPENTINIZED HARZBURGITE

Grain size: Coarse

Texture: Porphyroclastic.

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	0	90			
Orthopyroxene.	0	7	0.08-8		

ACCESSORY MINERAL NAME

Spinel.	1	1.5	0.02-1.5	Anhedral.	Interstitial.
Clinopyroxene.	0	3	0.04-4	Anhedral.	

SECONDARY MINERAL NAME

SECONDARY MINERAL NAME	PERCENT	REPLACING/ FILLING
Serpentine.	99	Olivine, orthopyroxene
Iron oxide minerals.	1	0.01-0.1
Amphibole.	Trace.	

VEIN/FRACTURE FILLING

VEIN/FRACTURE FILLING	PERCENT	SIZE	ORIENTATION
Serpentine.			
Chlorite and smectite.			
Iron oxide minerals.			

COMMENTS: #43

Intense alteration. Olivine is elongated and its breakdown produces ribbon textures. Vein filling assemblages are serpentine, serpentine and smectite, and lesser chlorite. Clinopyroxene and orthopyroxene are difficult to distinguish due to degree of alteration.

STRUCTURE

Basite shows bent lattice and relics of subgrain development and recrystallization of former orthopyroxene. The anastomosing vein foliation is variably developed, nonexistent in some domains, strongly developed in others. Apparent pressure shadows develop on the margins of basites.

153-920B-13R-1 (Piece 2A, 16 cm)

Observer: KIY

Rock Name: SERPENTINIZED HARZBURGITE

Grain size: Coarse.

Texture: Porphyroclastic.

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	3	87	0.1-2.1	Anhedral.	
Orthopyroxene.	3	8	0.2-5.2	Anhedral.	

ACCESSORY MINERAL NAME

Clinopyroxene.	3	4	0.1-2.2	Anhedral.	Interstitial in orthopyroxene.
Spinel.	<1	<1	0.05-1.4	Anhedral.	

SECONDARY MINERAL NAME

SECONDARY MINERAL NAME	PERCENT	REPLACING/ FILLING
Serpentine.	91	Olivine, orthopyroxene.
Magnetite.	3	Olivine.
Chlorite.	5	Clinopyroxene, serpentine.
Talc.	1	

VEIN/FRACTURE FILLING

VEIN/FRACTURE FILLING	PERCENT	SIZE	ORIENTATION
Serpentine, magnetite, talc, talc, carbonate minerals.		0.1-1	See comments.

COMMENTS: #44

STRUCTURE

Anastomosing vein foliation is absent and rock is dominated by a mesh network of serpentine veins. Veins in this fabric are composed of serpentine with fibers at high angle to vein walls and magnetite seams. Thicker veins occur in two sets that make an angle of 75° and show complex crack-seal histories. Olivine subgrains are relatively equant and show only a few subgrain boundaries. Some grains show undulose extinction. Subgrains show lobate boundaries. Orthopyroxene cleavage planes are bent and grains show sweeping undulose extinction. Round subgrains develop at contacts between two orthopyroxene grains. No strong asymmetry of porphyroclasts is seen. Clinopyroxene occurs as equant anhedral subgrains with weakly sutured and lobate boundaries. Spinel grains are oriented at a low angle to the long axis of the thin section.

SITE 920

153-920B-13R-1 (Piece 2B, 38 cm)

Observer: CJS

Rock Name: SERPENTINIZED HARZBURGITE

Grain size: Coarse.

Texture: Porphyroclastic.

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	8	90	0.5-2	Anhedral.	
Orthopyroxene.	7	10	0.1-5	Anhedral.	

ACCESSORY

MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Spinel	<1	<1	<0.1	Anhedral.	
Clinopyroxene.	<1	<1		Anhedral.	

SECONDARY

MINERAL NAME	PERCENT	REPLACING/ FILLING
Serpentine.	85	Orthopyroxene, olivine.
Iron oxide minerals.	<1	Orthopyroxene, olivine.

COMMENTS: #45

STRUCTURE

Equigranular texture of olivine. Anastomosing fabric producing ribbon textures.

153-920B-13R-1 (Piece 2D, 72cm)

Observer: KIY

Rock Name: SERPENTINIZED HARZBURGITE

Grain size: Coarse.

Texture: Porphyroclastic.

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	6	84	0.1-1.2	Anhedral.	
Orthopyroxene.	8	12	0.2-7.5	Anhedral.	

ACCESSORY

MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Spinel.	1	1	0.05-1.2	Anhedral.	Holly leaf, Color: brown to yellowish brown.
Clinopyroxene.	3	3	0.1-2.2	Anhedral.	

SECONDARY

MINERAL NAME	PERCENT	REPLACING/ FILLING
Serpentine.	76	Olivine, orthopyroxene.
Iron oxide minerals.	3	Olivine.
Chlorite.	3	Orthopyroxene.

VEIN/FRACTURE

FILLING	PERCENT	SIZE	ORIENTATION
Serpentine and iron oxide minerals + carbonate(?).			Subparallel to elongation of orthopyroxene.

COMMENTS: #46

STRUCTURE

Anastomosing vein foliation is absent. This sample is dominated by a mesh network of serpentine veins. Veins are composed of serpentine fibers at high angle to vein wall and magnetite seams. Thicker veins have a dominant orientation parallel to the long axis of orthopyroxene grains and have jagged margins that crudely mimic the mesh texture of the matrix. Olivine subgrains are relatively equant and show only a few subgrain boundaries. Some grains show undulose extinction. Subgrains show lobate boundaries. In larger grains of orthopyroxene, cleavage planes are bent and grains show sweeping undulose extinction. Equant subgrains develop along margins. No strong asymmetry to porphyroclasts is seen. Round anhedral grains of clinopyroxene exhibit weakly lobate boundaries. Spinel grains show no preferential orientation.

153-920B-13R-3 (Piece 1B, 90 cm)

Observer: CJS

Rock Name: SERPENTINIZED HARZBURGITE

Grain size: Coarse.

Texture: Porphyroclastic.

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	1	85	0.1-1	Anhedral.	Primary and neoblastic grains.
Orthopyroxene.	1	13	2-4	Anhedral.	

ACCESSORY

MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Spinel.	<1	<1	<0.1	Anhedral.	

SECONDARY

MINERAL NAME	PERCENT	REPLACING/ FILLING
Serpentine.	98	Olivine, orthopyroxene
Iron oxide minerals.	<1	Olivine, orthopyroxene

As breakdown during serpentinization.

COMMENTS: #47

STRUCTURE

Olivine shows both equigranular and fine-ribbed texture. Bastite shows bent lattice and relics of subgrain development and recrystallization of former orthopyroxene. The anastomosing vein foliation is variably developed, nonexistent in some domains, strongly developed in others. Apparent pressure shadows develop on the margins of bastites. A very thin rim contains recrystallized olivine (grain size = 1 mm). Orthopyroxene porphyroclasts locally kinked, and also occur as dynamically recrystallized grains.

153-920B-13R-3 (Piece 5B, 105 cm)
 Rock Name: METAGABBRO
 Grain size: Coarse.
 Texture: Pervasively metamorphosed.

Observer: CJS

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Plagioclase.	30	50	5-6		Altered adjacent to vein.
Clinopyroxene.	30	40	5-6		Strained.
ACCESSORY					
MINERAL NAME	PERCENT		SIZE	MORPHOLOGY	
Ilmenite.	10	10	2-6	Anhedral.	
SECONDARY					
MINERAL NAME	PERCENT	REPLACING/ FILLING	SIZE	MORPHOLOGY	DESCRIPTION
Actinolite.	10	Clinopyroxene.			
Brown Amphibole.	<1	Clinopyroxene.	0.1	Anhedral.	Small blebs in clinopyroxene.
Secondary plagioclase.	13	Plagioclase.			
Prehnite.	5	Plagioclase.	0.1-0.2	Subhedral.	Patches in plagioclase adjacent to prehnite vein.
Chlorite.	2	Plagioclase			
VEIN/FRACTURE					
FILLING	PERCENT		SIZE	ORIENTATION	
Prehnite.	100		4		

COMMENTS: #48
 STRUCTURE

Minerals in vein and wall rock are undeformed.

153-920B-13R-3 (Piece 5B, 132 cm)
 Rock Name: METAGABBRO
 Grain size: Coarse.
 Texture: Hypidiomorphic granular.

Observer: CJS

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Plagioclase.	30	50	5-6	Subhedral.	Altered adjacent to prehnite vein.
Clinopyroxene.	30	40	5-6	Subhedral.	Strained, altered to actinolite + brown amphibole.
Ilmenite.	10	10	2-6	Anhedral.	
SECONDARY					
MINERAL NAME	PERCENT	REPLACING/ FILLING	SIZE	MORPHOLOGY	DESCRIPTION
Prehnite.	5	Plagioclase.	0.1-0.2	Subhedral.	In plagioclase adjacent to prehnite vein.
Secondary plagioclase.	13	Plagioclase.			
Actinolite.	10	Clinopyroxene.			
Brown amphibole.	<1	Clinopyroxene.	0.1	Anhedral.	Small spots in clinopyroxene.
Chlorite.	2	Plagioclase.			
VEIN/FRACTURE					
FILLING	PERCENT		SIZE	ORIENTATION	
Prehnite.	100		4		

COMMENTS: #49

STRUCTURE

The total am
 Minor development of a fine-grained matrix between large kinked grains of plagioclase which show deformation twins (no development of a crystal-plastic foliation; the original magmatic crystal shape is preserved in some crystals).

SITE 920

153-920B-13R-3 (Piece 6, 134 cm)
 Rock Name: MYLONITIC GABBRO
 Grain size: Mylonitic.
 Texture: Mylonitic.

Observer: JFC

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Plagioclase.	25	55	12-0.001	Elongate.	See comments.
Clinopyroxene.	8	43	8-0.001	Equant.	See comments.
Orthopyroxene.	2	2	4	Elongate.	

ACCESSORY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL
Zircon.	<<1	<<1
Apatite.	<<1	<<1

SECONDARY MINERAL NAME	PERCENT	REPLACING/ FILLING	SIZE (mm)	MORPHOLOGY
Plagioclase.	30	Primary plagioclase.	0.001-0.6	Equant.
Clinopyroxene.	6	Primary clinopyroxene.	0.001-0.5	Equant.
Actinolite.	29	Primary and Secondary clinopyroxene.	0.1-8	Fibrous.

VEIN/FRACTURE FILLING	PERCENT	SIZE	ORIENTATION
Actinolite.	<<1	0.2	Parallel and 45° to foliation.

COMMENTS: #50
 STRUCTURE

Plagioclase shows core-mantle microstructures. Thick mantles of subgrains surround and are drawn out into tails around more strain-free porphyroclast cores that show internal undulatory extinction. Some porphyroclasts are asymmetric and show dextral shear sense. Recrystallized subgrains are very fine grained (10's of micrometers). Clinopyroxene occurs as equant anhedral subgrains with sutured and lobate boundaries.

153-920B-13R-4 (Piece 3, 23 cm)
 Rock Name: GNEISSIC GABBRO
 Grain size: Medium.
 Texture: Gneissic.

Observer: JFC

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Plagioclase.	50	50	0.07-0.2	Anhedral.	Mosaic equigranular, highly strained, based on extinction, mechanical twins.
Clinopyroxene.	24	24	0.01-1	Anhedral.	Strained porphyroclasts and strained to strain-free neoblasts.
Olivine.	4	4		Anhedral.	

ACCESSORY MINERAL NAME	PERCENT	SIZE (mm)
Opaque minerals.	3	0.01-0.08

SECONDARY MINERAL NAME	PERCENT	REPLACING/ FILLING	SIZE (mm)	DESCRIPTION
Brown hornblende.	20	20?	0.03-0.8	Brown amphibole and opaque minerals replace clinopyroxene.

COMMENTS: #51

Brown hornblende partially replacing clinopyroxene as discrete grains.

STRUCTURE

Slide contains sheared contact between gneissic gabbro and amphibolite. Plagioclase neoblasts have sutured and polygonal grain boundaries and an average grain size of 50µm. original olivine and clinopyroxene are recrystallized, elongated, and replaced by brown amphibole. Lineation and foliation is defined by preferred shape orientation of clinopyroxene porphyroclasts. Aggregates of brown amphibole define a crude layering of plagioclase-rich and clinopyroxene and amphibole-rich zones. Some larger clinopyroxene porphyroclasts/remnant igneous grains (2-6 mm long) occur in a layer at one edge of the slide.

153-920B-13R-4 (Piece 5, 42 cm) Observer: ROS
 Rock Name: AMPHIBOLITE GNEISS-GABBROIC GNEISS CONTACT
 Grain size: Fine to coarse.
 Texture: Gneissic to mylonitic.

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Plagioclase.	75	75	0.02-14	Anhedral.	Large, extremely strained plagioclase porphyroclasts surrounded by fine-grained, recrystallized plagioclase. Mechanical twins.
Clinopyroxene.	10	11	0.02-3	Anhedral.	Some magmatic twins, also recrystallized porphyroclasts.
Iron oxide minerals.	13	13	0.1-2	Anhedral.	Two phases, magnetite (well polished) and hemoilmenite (poorer polish, slight pink tinge, hematite exsolution lamellae).
ACCESSORY MINERAL NAME					
Orthopyroxene.	0.8	1.0	2.4-5.6	Subhedral.	Bent, strained crystals with undulatory extinction.
SECONDARY MINERAL NAME					
Actinolite.	PERCENT 0.8	REPLACING/FILLING Clinopyroxene.	<0.2	Anhedral/subhedral.	
Chlorite.	0.2	Orthopyroxene.	<0.2	Anhedral.	
Sulfide minerals.	0.2		<0.5	Anhedral.	Rounded grains. Pyrite and chalcopyrite (pyrite >> chalcopyrite).

COMMENTS: #52

This section samples the contact between the Unit 6 amphibolite gneiss and the Unit 7 gabbroic gneiss. The modal estimate is for the mylonitic gabbro (gneiss). Modal estimate for the amphibolite gneiss: amphibole 18%, clinopyroxene 25%, plagioclase 54%, iron oxide minerals 2%, sulfide minerals <1%. The gneissic fabric is parallel in both rock types. The contact is marked by oxide mineral schlieren. Clinopyroxene in the amphibolite gneiss is partially replaced by amphibole, and there are also discrete amphibole grains. Foliation in this part of the section is defined by plagioclase-rich and ferromagnesian mineral-rich layers.

STRUCTURE

Plagioclase has core-mantle microstructures. Plagioclase cores show patchy and undulose extinction with low-angle subgrain walls that are sinistrally oblique to the main shear zone orientation. The plagioclase is mylonitized. Plagioclase neoblasts have sutured grain boundaries and an average grain size of 50 μm . Original olivine and clinopyroxene are strongly recrystallized, elongated, and replaced by brown amphibole.

153-920D-2R-1 (Piece 4, 21 cm) Observer: CJS
 Rock Name: SERPENTINIZED DUNITE-HARZBURGITE
 Grain size: Coarse.
 Texture: Porphyroclastic.

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	3	95	0.5-1.0	Anhedral.	
Orthopyroxene.	2	5	1-6	Anhedral.	
ACCESSORY MINERAL NAME					
Clinopyroxene.	<1	<1	<0.5	Anhedral.	Occurs as wide exsolution lamellae in orthopyroxene.
Spinel.	<1	<1	<0.2	Anhedral.	
SECONDARY MINERAL NAME					
Serpentine.	PERCENT 95	REPLACING/FILLING Olivine and orthopyroxene.			
VEIN/FRACTURE FILLING					
Serpentine.	PERCENT		SIZE 2-3	ORIENTATION	Crosscuts foliation.

COMMENTS: #53 & #54

STRUCTURE

Porphyroclasts <1 mm in size with close-spaced straight low-angle subgrain boundaries. Original medium grained-sized texture locally preserved. Olivine shows development of fine-grained recrystallized matrix. Orthopyroxene found as 1-mm-sized porphyroclasts. Anastomosing vein fabric moderately developed, except on the margins of porphyroclasts where it crudely intensifies around the porphyroclasts.

SITE 920

153-920D-2R-1 (Piece 8, 70 cm)

Observer: CAN

Rock Name: SERPENTINIZED HARZBURGITE-LHERZOLITE

Grain size: Coarse.

Texture: Porphyroclastic.

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	25	60	0.5–20	Anhedral.	Neoblasts are equant.
Orthopyroxene.	25	35	10–20	Anhedral.	Porphyroclasts contain clinopyroxene exsolution lamellae.
Clinopyroxene.	3	5	0.2–2	Anhedral.	Interstitial shape, associated with orthopyroxene and rimming some spinels.

ACCESSORY MINERAL NAME	PERCENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Spinel.	1.5	2	0.4–2.0	Holly leaf.	Associated with pyroxene.

SECONDARY MINERAL NAME	PERCENT	REPLACING/ FILLING	MORPHOLOGY	DESCRIPTION
Serpentine.	40	Olivine, pyroxene.	Mesh texture.	
Magnetite.	3	Olivine, spinel.		
Talc.	<1	Olivine, orthopyroxene.		Occurs in patches.
Amphibole.	3	Orthopyroxene, clinopyroxene.		(Cummingtonite?)

VEIN/FRACTURE FILLING	PERCENT	SIZE	ORIENTATION	DESCRIPTION
Clinopyroxene, chlorite, amphibole, apatite, and zircon.				Clinopyroxene: 5%–10%, euhedral crystals, 0.8–1 mm, partially altered to amphibole. Chlorite: 70%, fine grained, forms groundmass of vein. Amphibole: 20%, brown-green to colorless, rims veins, contacts with peridotite and replaced pyroxenes in vein. Apatite: <<1%, contains fluid inclusions. Zircon: <1%.

COMMENTS: #55
STRUCTURE

Incipient development of straight anastomosing vein fabric with variable local orientations.

Orthopyroxene occurs as large porphyroclasts with local development of kinks and subgrains. Orthopyroxene cleavage planes are crudely aligned from one grain to the next. Olivine is dynamically recrystallized, shows straight subgrain boundaries. Clinopyroxene commonly recrystallized around margins of orthopyroxene. Locally olivine, orthopyroxene, and clinopyroxene occur as clusters of recrystallized grains.

153-920D-2R-1 (Piece 11, 100 m)

Observer: NOR

Rock Name: OXIDE CLINOPYROXENITE

Grain size: Coarse.

Texture: Poikilitic.

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Clinopyroxene.	30	55	0.5–10	Anhedral.	Exsolution texture; partially recrystallized into fine-grained clinopyroxene.
Titanomagnetite.	23	43	0.5–1	Anhedral.	The marginal part of grains are altered into sphene and hematite.
Plagioclase.	0	2	5	Anhedral.	Totally altered.

ACCESSORY MINERAL NAME	PERCENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Apatite.	<1	<1	0.1	Anhedral.	Included in opaque oxide mineral-rich part. Contains vapor-dominated fluid inclusions which occur along healed microfractures.

SECONDARY MINERAL NAME	PERCENT	REPLACING/ FILLING	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Brown hornblende.	4	Clinopyroxene.	0.5–2.0	Anhedral.	
Actinolite.	<1	Brown hornblende.	0.5–2.0	Anhedral.	
Clay minerals, chlorite.	2	Plagioclase.			
Prehnite.	<1	Plagioclase.	0.1–1.0	Anhedral.	
Secondary clinopyroxene.	20	Clinopyroxene.	0.1–0.5	Anhedral.	Recrystallized.
Titanite.	2	Titanomagnetite.			Exsolved from titanomagnetite.
Ilmenite.	7	Titanomagnetite.			
Magnetite.	9	Titanomagnetite.			
Sulfide minerals.	21	Titanomagnetite.			
Epidote.	Trace.	Plagioclase.	0.1	Anhedral.	After plagioclase and associated with chlorite and zeolite.

VEIN/FRACTURE FILLING	PERCENT	SIZE	ORIENTATION	DESCRIPTION
Prehnite, clay minerals, actinolite, chlorite, and serpentine. Clay minerals.	3			

COMMENTS: #56

Porphyroclastic texture. Fine-grained matrix of clinopyroxene with minor apatite and amphibole 0.1 to 0.4 mm in size. Clinopyroxene 1–7 mm in size. Abundant interstitial oxides form string defining a weak lineation.

153-920D-2R-1 (Piece 13, 116 cm)

Observer: CAN

Rock Name: SERPENTINIZED HARZBURGITE

Grain size: Coarse.

Texture: Fine-grained porphyroclastic to mylonitic.

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	70	82	<5	Anhedral.	Elongated porphyroclasts with subgrain boundaries and polygonal neoblasts; neoblasts 0.04–0.4 mm in size.
Orthopyroxene.	10	15	<10	Anhedral.	Elongated to ribbon shaped and recrystallized.
ACCESSORY MINERAL NAME					
Spinel.	1	1	0.4–1	Anhedral.	
Clinopyroxene.	1.5	2	0.04–0.1	Anhedral.	Equant and recrystallized.
SECONDARY MINERAL NAME					
Amphibole.	3	Pyroxene.		Acicular.	
Iron oxide minerals.	1	Olivine and spinel			Disseminated.
Serpentine.	15	Olivine, orthopyroxene.		Mesh texture.	
VEIN/FRACTURE FILLING					
Chlorite, amphibole, pyroxene, apatite, zircon, and plagioclase.	PERCENT		SIZE	ORIENTATION	
	1				Parallel to peridotite foliation. Amphibole brown to colorless; pyroxene euhedral.

COMMENTS: #57

STRUCTURE

Mylonitic porphyroclastic texture. Strongly dynamically recrystallized olivine surrounds elongated orthopyroxene porphyroclasts. Olivine is thoroughly dynamically recrystallized and has bimodal grain-size distribution with peaks at 0.2 and 0.02 mm. Olivine grains are equidimensional. Fine-grained horizons alternate with the large grain-size horizons. Orthopyroxene occurs as large elongated porphyroclasts with core-mantle microstructure.

153-920D-2R-1 (Piece 14, 138 cm)

Observer: CAN

Rock Name: HARZBURGITE

Grain size:

Texture: Mylonitic.

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	30	80	0.04–0.4	Elongated	Porphyroclasts and neoblasts.
Orthopyroxene.	7	17	0.04–0.1	Elongated.	Porphyroclasts and neoblasts.
ACCESSORY MINERAL NAME					
Clinopyroxene.	1	2	0.04–0.1	Neoblasts.	
Spinel.	0.1	1	0.4–1	Anhedral.	
SECONDARY MINERAL NAME					
Serpentine.	57	Olivine/clinopyroxene.			Mesh texture.
Talc.	1	Pyroxene.			Patches.
Magnetite.	2	Olivine/spinel.			Disseminated.
Amphibole.	2	Pyroxene.			Acicular.
VEIN/FRACTURE FILLING					
Serpentine.	PERCENT		SIZE	ORIENTATION	
	100		2	Crosscutting.	
Serpentine.	100		1–3	Parallel foliation.	

COMMENTS: #58

Similar type of veining and fabric as in thin section #57 (920D-2R-2, 116–199 cm).

STRUCTURE

Olivine is pervasively recrystallized. Grain size ranges from 200 to 10 μm . Relict coarse-grained olivine is locally present. Margins of host grains can be seen by size variations in the subgrains. Orthopyroxene occurs as large equant porphyroclasts with core-mantle microstructure. Dextral shear sense indicators include oblique olivine grain elongations, subgrain boundaries, and dynamically recrystallized tails on orthopyroxene porphyroclasts.

SITE 920

153-920D-3R-1 (Piece 3B, 41 cm)
 Rock Name: SERPENTINIZED HARZBURGITE
 Grain size: Coarse.
 Texture: Porphyroclastic.

Observer: CAN

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	0	80-85			
Orthopyroxene.	0	10-15	1-10	Anhedral.	
ACCESSORY MINERAL NAME					
Clinopyroxene.	0	?			
Spinel.	1.5	2	0.1-2	Anhedral.	Spinel grains in elongated streaks, especially associated with small bastite.
SECONDARY MINERAL NAME					
Serpentine.	PERCENT 96	REPLACING/FILLING Olivine/orthopyroxene.		Mesh texture.	
Magnetite.	4	Olivine/spinel.		Disseminated.	
VEIN/FRACTURE FILLING					
Serpentine.	PERCENT		SIZE 0.3	ORIENTATION	

COMMENTS: #59

STRUCTURE

Spinel rich-horizons are oblique to a weakly developed anastomosing foliation.

153-920D-3R-1 (Piece 8, 87 cm)
 Rock Name: SERPENTINIZED HARZBURGITE
 Grain size: Medium.
 Texture: Porphyroclastic.

Observer: CAN

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	12	70	0.8-3	Anhedral.	Some elongated porphyroclasts with subgrain boundaries and polygonal neoblasts.
Orthopyroxene.	15	25	1-5	Anhedral.	
ACCESSORY MINERAL NAME					
Clinopyroxene.	3	4	1-4	Anhedral.	Commonly interstitial.
Spinel.	<1	<1	0.1-2		Dark brown/black.
SECONDARY MINERAL NAME					
Serpentine.	PERCENT 66	REPLACING/FILLING Olivine/orthopyroxene.		Mesh textured.	
Magnetite.	4	Spinel/oxide minerals.	0.02-0.5		Within serpentine mesh.
Tremolite.	1	Orthopyroxene and clinopyroxene.		Irregular.	Near altered dikelet margins.
Amphibole.	1	Orthopyroxene.			Near altered dikelet margins.
VEIN/FRACTURE FILLING					
Serpentine ± chlorite.	PERCENT		SIZE 0.3-0.6	ORIENTATION	
Altered magmatic veins.			0.5-2		Thick vein crosscuts orthogonal veins.
Serpentine.	35				Patches and alteration of clinopyroxene.
Clay minerals.	25				Altered euhedral plagioclase.
Chlorite.	15				In patches.
Clinopyroxene.	10				Anhedral grains and syntaxial growth on orthopyroxene porphyroclasts near margins.
Amphibole.	5				Rims around spinel and alteration of clinopyroxene.
Spinel.	5				Anhedral grains distributed in streaks near vein margins.
Unidentified mineral.	<1				Three grains in thinnest vein, has spinel habit but not isotropic.

COMMENTS: #60

Harzburgite is freshest near vein.

STRUCTURE

The anastomosing foliation is poorly developed. Olivine shows straight low-angle subgrain boundaries. Orthopyroxene shows a weak undulatory extinction. No apparent preferred elongation to porphyroclasts. Clinopyroxene shows weak to no subgrain development.

153-920D-4R-1 (Piece 4, 14 cm)

Observer: CDW

Rock Name: SERPENTINIZED HARZBURGITE

Grain size: Medium-coarse.

Texture: Porphyroclastic.

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	10	84	0.2-1.2		Serpentinized, ± chlorite.
Orthopyroxene.	5	12	1-6		Serpentinized.
ACCESSORY MINERAL NAME					
Clinopyroxene.	<1	1	0.06-1.5		Altered to tremolite/chlorite.
Spinel.	1	1	0.05-2		Brown/black.
SECONDARY MINERAL NAME					
Serpentine.	75	REPLACING/ FILLING Olivine/ orthopyroxene.		Mesh texture.	
Magnetite.	5		0.01-0.5		Product of serpentinization.
Tremolite/chlorite.	4	Olivine/orthopyroxene/ clinopyroxene.			Irregular.
VEIN/FRACTURE FILLING					
Fine-grained serpentine, ± chlorite, tremolite. ± chlorite, tremolite. Carbonate minerals. Serpentine.	PERCENT		SIZE	ORIENTATION	
			0.4-3		Crosscut by three generations of serpentine veins.
			0.05-0.1		Latest veins. Crosscut by veins of serpentine, tremolite, and chlorite.

COMMENTS: #61

STRUCTURE

Olivine occurs as medium-grained recrystallized mosaic (1 mm grain size) with well-developed subgrains. Orthopyroxene forms large porphyroclasts. Anastomosing foliation is concentric around porphyroclasts but shows a moderate preferred orientation in the thin section.

153-920D-4R-1 (Piece 5, 22 cm)

Observer: NOR

Rock Name: SERPENTINIZED HARZBURGITE

Grain size: Coarse.

Texture: Porphyroclastic.

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	0	83			
Orthopyroxene.	0	17	0.5-10	Anhedral.	
SECONDARY MINERAL NAME					
Serpentine.	95	REPLACING/ FILLING Olivine/orthopyroxene.			
Iron oxide minerals.	5	Olivine/orthopyroxene.			
Actinolite.	<1	Orthopyroxene.			
VEIN/FRACTURE FILLING					
Serpentine, iron oxide minerals. Carbonate minerals (late vein).	PERCENT		SIZE	ORIENTATION	
			0.02-0.1		

COMMENTS: #62

STRUCTURE

Very well-developed anastomosing foliation.

SITE 920

153-920D-4R-1 (Piece 9, 55 cm)

Observer: JMF

Rock Name: SERPENTINIZED HARZBURGITE

Grain size: Medium-coarse.

Texture: Porphyroclastic.

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	<<1	79	0.2-2	Anhedral.	
Orthopyroxene.	0	15	0.2-6	Anhedral.	
Clinopyroxene.	4	6	0.5-3	Anhedral.	
ACCESSORY MINERAL NAME					
Spinel.	<1	<1	2.5	Anhedral.	Cracks, oxidized.
SECONDARY MINERAL NAME					
Serpentine.	66	REPLACING/ FILLING Olivine/orthopyroxene.			
Tremolite.	3				
Magnetite.	2				
Talc.	<1				
VEIN/FRACTURE FILLING					
Serpentine, brucite, and tremolite.	PERCENT 5		SIZE	ORIENTATION	Zoned, center to margin: fine-grained serpentine + brucite, coarse-grained serpentine + tremolite.

COMMENTS: #63

The clinopyroxene grains are clustered along a 2-mm-long contact with olivine.

STRUCTURE

Weak to moderate dynamic recrystallization of olivine, orthopyroxene, and clinopyroxene. Weak to moderate development of the anastomosing foliation.

153-920D-4R-1 (Piece 12, 83 cm)

Observer: CDW

Rock Name: SERPENTINIZED HARZBURGITE

Grain size: Medium.

Texture: Porphyroclastic.

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	15	78	0.6-3.5	Anhedral.	Recrystallized, kink banded in mosaic texture near margin with metaclinopyroxenite.
Orthopyroxene.	12	20	1.5-4	Anhedral.	
Spinel.	<1	<1	0.1-2		Dark brown/black.
ACCESSORY MINERAL NAME					
Spinel.	<1	1	0.1-1.8	Anhedral.	
SECONDARY MINERAL NAME					
Serpentine.	70	REPLACING/ FILLING Olivine/orthopyroxene.			Mesh texture. Bastite pseudomorphs after orthopyroxene.
Magnetite.	3	Olivine/ orthopyroxene.	<1	Anhedral.	Product of serpentinization.
Tremolite/chlorite.	25	Clinopyroxene.		Aggregates.	Prismatic crystal aggregates.
VEIN/FRACTURE FILLING					
Serpentine.	PERCENT		SIZE 0.3-0.6	ORIENTATION	

COMMENTS: #64

This thin section is a composite of serpentized harzburgite with a metaclinopyroxenite vein. The vein filling material was probably cummingtonite, now almost completely transformed into tremolite.

STRUCTURE

Weak to moderate dynamic recrystallization of olivine, orthopyroxene, and clinopyroxene in harzburgite.

153-920D-4R-2 (Piece 3, 17 cm)

Observer: CDW

Rock Name: SERPENTINIZED HARZBURGITE

Grain size:

Texture: Porphyroclastic.

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	3	90	Undetermined.		Serpentinized.
Orthopyroxene.	<1	8	11		
ACCESSORY MINERAL NAME					
Clinopyroxene.	<1	2	1-2.5		
Spinel.	<1	<1	0.05-0.3		Dark brown/black.
SECONDARY MINERAL NAME					
Serpentine.	PERCENT	REPLACING/ FILLING			
Magnetite.	91	Olivine/orthopyroxene.		Mesh texture.	
	5			Within mesh.	
VEIN/FRACTURE FILLING					
Serpentine.	PERCENT		SIZE	ORIENTATION	
			0.1-0.4		

COMMENTS: #65

Clinopyroxene surrounded by orthopyroxene and olivine in augen.

STRUCTURE

Anastomosing foliation locally well developed but shows variations in orientations. Olivine and large bastites show few deformation features.

153-920D-4R-2 (Piece 14, 100 cm)

Observer: CDW

Rock Name: SERPENTINIZED HARZBURGITE

Grain size: Fine-medium.

Texture: Porphyroclastic.

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	1	90			Serpentinized.
Orthopyroxene.	4	8	0.5-4		Weakly serpentinized.
ACCESSORY MINERAL NAME					
Clinopyroxene.	<1	2	0.1-0.2		
Spinel.	<1	<1	0.01-0.8		Brown.
SECONDARY MINERAL NAME					
Serpentine.	PERCENT	REPLACING/ FILLING			
Magnetite.	90	Olivine/orthopyroxene.		Mesh texture.	
	5			Within mesh texture.	
VEIN/FRACTURE FILLING					
Serpentine.	PERCENT		SIZE	ORIENTATION	
			0.1-0.6		

COMMENTS: #66

Strained clinopyroxene in interstitial position (in clusters) between orthopyroxene fragments.

STRUCTURE

Weak to moderate development of the anastomosing foliation. Orthopyroxene shows strong dynamic recrystallization.

SITE 920

153-920D-4R-3 (Piece 9, 57 cm)

Observer: CDW

Rock Name: SERPENTINIZED HARZBURGITE

Grain size: Medium-coarse.

Texture: Porphyroclastic.

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	5	85	0.2-1.5		Rounded.
Orthopyroxene.	10	14	1-5	Subhedral.	Rounded.
ACCESSORY					
MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Spinel.	<1	<1	0.05-0.8		Brown.
SECONDARY					
MINERAL NAME	PERCENT PRESENT	REPLACING/ FILLING	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Serpentine.	80	Olivine/orthopyroxene.	0.01-0.6	Mesh texture.	
Magnetite.	3			Within mesh texture.	
Talc.	1	Orthopyroxene.			Pseudomorphs of orthopyroxene, disseminated in serpentine.
VEIN/FRACTURE					
FILLING	PERCENT		SIZE	ORIENTATION	
Serpentine ± iron oxide minerals.			0.1-0.5		

COMMENTS: #67

STRUCTURE

Moderate development of the anastomosing foliation. Olivine shows moderate recrystallization with an average grain size of 1 mm. Orthopyroxene forms large porphyroclasts that are partly recrystallized.

153-920D-5R-2 (Piece 1A, 33 cm)

Observer: CDW

Rock Name: SERPENTINIZED HARZBURGITE

Grain size: Medium.

Texture: Porphyroclastic.

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	0	86			Serpentinized.
Orthopyroxene.	6	13	1-4		Serpentinized. Two orthopyroxene grains have an interdigitated boundary. Some orthopyroxenes have exsolved clinopyroxene.
ACCESSORY					
MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Spinel.	1	1	0.05-0.6		Brown cores, black margins.
SECONDARY					
MINERAL NAME	PERCENT PRESENT	REPLACING/ FILLING	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Serpentine.	88	Olivine/orthopyroxene.	0.01-0.2	Mesh texture.	
Magnetite.	5			Within mesh texture.	
VEIN/FRACTURE					
FILLING	PERCENT		SIZE	ORIENTATION	
Serpentine.			0.2-0.4		

COMMENTS: #68 AND #69

STRUCTURE

Well-developed mesh texture in serpentine. Weakly developed anastomosing foliation.

153-920D-5R-4 (Piece 1, 5 cm)

Observer: NOR

Rock Name: SERPENTINIZED HARZBURGITE

Grain size: Medium.

Texture: Porphyroclastic.

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	0	88			
Orthopyroxene.	0	10	1-3	Anhedral.	

ACCESSORY MINERAL NAME

Clinopyroxene.	0	2	0.2-2.5	Anhedral.	
Spinel.	<1	1	0.05-2	Anhedral.	

SECONDARY MINERAL NAME

SECONDARY MINERAL NAME	PERCENT	REPLACING/ FILLING
Serpentine.	97	Olivine/orthopyroxene.
Iron oxide minerals.	3	Olivine/orthopyroxene.
Chlorite/tremolite.	<1	Clinopyroxene.

VEIN/FRACTURE FILLING

VEIN/FRACTURE FILLING	PERCENT	SIZE	ORIENTATION
Serpentine, iron oxide minerals.		0.05-0.4	

COMMENTS: #70

STRUCTURE

Weak to moderate development of the anastomosing foliation.

153-920D-6R-1 (Piece 10A, 117 cm)

Observer: CDW

Rock Name: SERPENTINIZED HARZBURGITE

Grain size: Medium.

Texture: Porphyroclastic.

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	<1	86	0.2-0.7		
Orthopyroxene.	1	13	0.5-6		

ACCESSORY MINERAL NAME

Clinopyroxene.	0	1	0.2-0.4		Altered to tremolite?/pyrite.
Spinel.	<1	<1	0.05-0.6		Brown, black rims.

SECONDARY MINERAL NAME

SECONDARY MINERAL NAME	PERCENT	REPLACING/ FILLING	MORPHOLOGY
Serpentine.	94	Olivine/ orthopyroxene.	Mesh texture.
Magnetite.	4		0.01-0.3
Tremolite/chlorite.	<1	Clinopyroxene/ orthopyroxene.	Within mesh texture.

VEIN/FRACTURE FILLING

VEIN/FRACTURE FILLING	PERCENT	SIZE	ORIENTATION
Serpentine.		0.1-0.3	

COMMENTS: #71

STRUCTURE

Bastite shows strongly kinked and twisted cleavages. Anastomosing foliation locally well developed.

SITE 920

153-920D-6R-2 (Piece 9A, 45 cm)

Observer: CDW

Rock Name: SERPENTINIZED HARZBURGITE

Grain size: Coarse.

Texture: Porphyroclastic.

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	<1	84			
Orthopyroxene.	0	14	0.5-4	Anhedral.	
ACCESSORY					
MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Clinopyroxene.	0	1	0.2-1		Altered to tremolite.
Spinel.	<1	1	0.03-2	Anhedral.	Brown/black.
SECONDARY					
MINERAL NAME	PERCENT	REPLACING/ FILLING	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Serpentine.	97	Olivine, orthopyroxene, clinopyroxene.			Mesh texture.
Iron oxide minerals.	2	Olivine, orthopyroxene, clinopyroxene.	0.01-0.2		Some occurs within serpentine mesh spinel texture.
Chlorite.	<<1	Clinopyroxene.			
Actinolite.	<1	Clinopyroxene.			

VEIN/FRACTURE FILLING	PERCENT	SIZE	ORIENTATION
Actinolite.		<0.5	
Serpentine and iron oxide minerals.			

COMMENTS: #72

STRUCTURE

Anastomosing foliation weakly developed.

153-920D-7R-1 (Piece 10, 67 cm)

Observer: CDW

Rock Name: SERPENTINIZED HARZBURGITE

Grain size: Medium-coarse.

Texture: Porphyroclastic.

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	13	92	0.1-2.4		
Orthopyroxene.	<1	4	0.8-5		
ACCESSORY					
MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Clinopyroxene.	<1	1	0.3-1.2		
Spinel.	3	3	0.05-2		Brown/black; surrounded by chlorite.
SECONDARY					
MINERAL NAME	PERCENT	REPLACING/ FILLING	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Serpentine.	80	Olivine/orthopyroxene.			Mesh texture.
Magnetite.	3		0.01-0.2		Within mesh texture.
Tremolite/chlorite.	<1				

VEIN/FRACTURE FILLING	PERCENT	SIZE	ORIENTATION
Fine-grained serpentine and iron oxide minerals.		0.2-0.8	
Talc	1		
Tremolite and clinopyroxene relics.			

COMMENTS: #73

STRUCTURE

Olivine host grains are elongated parallel to spinel-rich horizons.

153-920D-7R-2 (Piece 2B, 22 cm)

Observer: NOR

Rock Name: AMPHIBOLITIZED MICROGABBRO

Grain size: Medium.

Texture: Equigranular.

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Plagioclase.	60	60	0.1-0.7	Anhedral.	Albite and carlsbad twinning, deformed locally.
Clinopyroxene.	10	30	0.1-1.5	Anhedral.	Subophitically encloses plagioclase laths.
Olivine.	2	10	0.1-1.2	Anhedral.	Kink banded.

ACCESSORY

MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Iron oxide minerals.	<1	<1	0.01-0.3	Anhedral.	
Sulfide minerals.	<1	<1	0.01-0.3	Anhedral.	

SECONDARY

MINERAL NAME	PERCENT PRESENT	REPLACING/ FILLING	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Brown hornblende.	20	Clinopyroxene.	0.1-1.0	Anhedral.	
Actinolite.	<<1	Brown hornblende.	0.07		Pale brownish green to green.
Talc.	5	Olivine.			
Amphibole.	2	Olivine.			
Iron oxide minerals.	1	Olivine.			

VEIN/FRACTURE

FILLING	PERCENT	SIZE	ORIENTATION	DESCRIPTION
Serpentine.				Veins make up less than 2%-3% of the rock.

COMMENTS: #74 and #75

STRUCTURE

The rock has preserved its PRIMARY magmatic texture. Undulose extinction of olivine crystals and deformation twins in plagioclase.

153-920D-8R-1 (Piece 15, 122 cm)

Observer: CON

Rock Name: SERPENTINIZED HARZBURGITE

Grain size: Coarse.

Texture: Porphyroclastic.

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	0	80-85	?	?	
Orthopyroxene.	<1	15-20	1-10	Anhedral.	No apparent elongation.

ACCESSORY

MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Clinopyroxene.	0	?	?		
Spinel.	<1	1	0.5-2	Anhedral.	Lobate shapes, commonly associated with bastite crystals. Spinel form streaks with elongation at a wide angle to the dominant set of anastomosing serpentine. Rimmed by ferrite chromite.

SECONDARY

MINERAL NAME	PERCENT PRESENT	REPLACING/ FILLING	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Serpentine.	95	Olivine, pyroxene.		Mesh.	
Iron oxide minerals.	4	Olivine, spinel.			

VEIN/FRACTURE

FILLING	PERCENT	SIZE	ORIENTATION	DESCRIPTION
Carbonate minerals.		<0.2		Set of thin carbonate mineral veins at wide angle to spinel elongation.

COMMENTS: #76

Distinction of clinopyroxene and orthopyroxene is difficult in this thin section because serpentinization is too extensive.

STRUCTURE

Bastite grains show weak kinking. Anastomosing foliation is locally well developed. Thin section contains microcracks.

SITE 920

153-920D-10R-2 (Piece 1, 0 cm)

Observer:

Rock Name: VEIN ACTINOTE CHLORITE

Grain size: Variable.

SECONDARY MINERAL NAME	PERCENT	REPLACING/ FILLING	SIZE	MORPHOLOGY	DESCRIPTION
Actinolite.	55		<2.5	Anhedral.	Dessucate aggregate, weak layering of actinolite and chlorite.
Chlorite.	41		<0.1	Anhedral.	
Iron oxide minerals.	4				Dusting of secondary oxide minerals.

VEIN/FRACTURE FILLING	PERCENT	SIZE	ORIENTATION
Chlorite and amphibole.		0.5	
Prehnite.		3	
Serpentine.			
Talc.		<0.2	

COMMENTS: #79

STRUCTURE

Chlorite, actinolite, and iron oxide mineral-bearing vein is folded. Prehnite vein is post-folding, normal to the fold axis of the other vein.

153-920D-10R-3 (Piece 9A, 74 cm)

Observer: CAN

Rock Name: SERPENTINIZED HARZBURGITE

Grain size: Coarse.

Texture: Porphyroclastic.

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	3	80-85	0.4-1.0		Porphyroclastic with subgrain boundaries and recrystallized polygonal grains. Weakly elongated, locally kinked.
Orthopyroxene.	4	15-20	1-10	Anhedral.	

ACCESSORY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Clinopyroxene.	<1	?	?		Occurs as exsolution lamellae in orthopyroxene.
Spinel.	<1	1		Anhedral.	Reddish-brown color. Preferred shape fabric dipping 10°-20° in plane of section.

SECONDARY MINERAL NAME	PERCENT	REPLACING/ FILLING	DESCRIPTION
Serpentine.	89	Olivine, orthopyroxene.	No clear anisotropy; no anastomosing microcracks.
Iron oxide minerals.	3	Olivine, spinel.	

COMMENTS: #80 and #81

STRUCTURE

Moderate development of the anastomosing foliation. Olivine shows moderate recrystallization and recovery with an average grain size of 1 mm. Orthopyroxene forms large porphyroclasts that are partly recrystallized.

153-920D-10R-4 (Piece 4, 36 cm)
 Rock Name: SERPENTINIZED HARZBURGITE
 Grain size: Medium-coarse.
 Texture: Porphyroclastic.

Observer: CJS

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	0	90	1-3	Anhedral.	
Orthopyroxene.	0	10	1-7.6	Anhedral.	
ACCESSORY					
MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Clinopyroxene.	<1	<1	2.5	Anhedral.	0.5 mm neoblasts on margins.
Spinel.	<1	<1	<1	Anhedral.	
SECONDARY					
MINERAL NAME	PERCENT PRESENT	REPLACING/ FILLING	SIZE	MORPHOLOGY	DESCRIPTION
Serpentine.	99	Olivine and orthopyroxene.			
VEIN/FRACTURE					
FILLING	PERCENT	REPLACING/ FILLING	SIZE	ORIENTATION	DESCRIPTION
Serpentine.			<0.5		Normal to orthopyroxene augen orientation. Serpentine forms 100% of the vein minerals.

Carbonate minerals.

COMMENTS: #82

Metaclinopyroxenite pod occurs in this composite thin section.

There are three generations of veins:

- 1) fibrous serpentine, 0.3 mm thick,
- 2) fibrous serpentine and smectite, 0.2 mm thick,
- 3) Carbonate minerals.

STRUCTURE

Contact between completely altered clinopyroxenite and serpentinitized harzburgite. Spinel trail crosscuts the serpentine vein fabric, but is parallel to elongation of porphyroclast lenses.

153-920D-11R-1 (Piece 4, 27 cm)
 Rock Name: SERPENTINIZED DUNITE
 Grain size:
 Texture: Equigranular.

Observer: CAN

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	0	95	Undet.	Undet.	?
ACCESSORY					
MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Spinel.	2	5	0.2-0.5	Anhedral.	Rounded with weak elongation.
SECONDARY					
MINERAL NAME	PERCENT PRESENT	REPLACING/ FILLING	SIZE	MORPHOLOGY	DESCRIPTION
Serpentine.	91	Olivine.		Mesh.	Very weak anisotropy with microcracks subparallel to spinel elongation.
Iron oxide minerals.	5	Olivine, spinel.			
VEIN/FRACTURE					
FILLING	PERCENT	REPLACING/ FILLING	SIZE	ORIENTATION	DESCRIPTION
Serpentine.	2.5		0.5		Oriented approximately 70° to spinel elongation.
Chlorite.	0.5				Composite vein with serpentine.
Magnetite.			0.01		

COMMENTS: #83

Possible serpentinitized clinopyroxene (<1%).

STRUCTURE

Serpentinized dunite. Well-developed mesh texture in serpentine. Weakly developed anastomosing foliation.

SITE 920

153-920D-11R-1 (Piece 7, 56 cm)
 Rock Name: METAGABBRO-VEIN
 Grain size: Coarse-very coarse.
 Texture:

Observer: NOR

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Plagioclase.	0	32			
Clinopyroxene.	30	34	1-6	Anhedral.	
Orthopyroxene.	<1	34	1-7	Anhedral.	

SECONDARY MINERAL NAME	PERCENT	REPLACING/ FILLING			
Prehnite.	30	Plagioclase.			
Secondary plagioclase.	2	Plagioclase.			
Chlorite.	10	Clinopyroxene.			
Clay minerals.	1	Clinopyroxene.			
Serpentine.	33	Orthopyroxene.			
Tremolite.	<1	Orthopyroxene.			Replacing orthopyroxene at the contact between prehnite-rich zone.

VEIN/FRACTURE FILLING	PERCENT	SIZE	ORIENTATION
Serpentine.	0.2		

COMMENTS: #84
 Prehnite-rich part surrounds the pyroxene-rich part. The prehnite likely replaces primary plagioclase.
 STRUCTURE
 Undeformed vein.

153-920D-11R-2 (Piece 4, 63 cm)
 Rock Name: SERPENTINIZED HARZBURGITE
 Grain size: Coarse.
 Texture: Porphyroclastic.

Observer: CAN

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	<1	80-85	0.2-0.4	Anhedral.	Relics of grains with subgrain boundaries in serpentine mesh.
Orthopyroxene.	0	10-15	1-10	Anhedral.	No consistent elongation.

ACCESSORY MINERAL NAME					
Clinopyroxene.	1	4-5	0.2-3	Anhedral.	Equant crystals, in aggregates with some recrystallization at grain margins.
Spinel.	1	1.5	0.1-1	Anhedral.	Lobate shapes, no consistent elongation.

SECONDARY MINERAL NAME	PERCENT	REPLACING/ FILLING			
Serpentine.	94	Olivine and orthopyroxene.		Mesh.	
Iron oxide minerals.	3	Olivine and spinel.			
Amphibole.	<1	Pyroxene.		Acicular.	
Chlorite.	<1	Pyroxene.		Mesh.	

VEIN/FRACTURE FILLING	PERCENT	SIZE	ORIENTATION
Serpentine.			
Actinolite and chlorite.		0.1-1	Network of thin subparallel serpentine-filled cracks. Oriented at 55°-60° dip in plane of the thin section.

COMMENTS: #85 and #86
 Clinopyroxene occurs in aggregates 1-5 mm in size, no clear elongation.
 STRUCTURE
 Well-developed mesh texture. Moderate development of the anastomosing foliation.
 Olivine shows moderate recrystallization and recovery with an average grain size of 1 mm.
 Orthopyroxene found as large porphyroclasts that are partly recrystallized.

153-920D-11R-3 (Piece 1, 22 cm)

Observer: CAN

Rock Name: SERPENTINIZED HARZBURGITE

Grain size: Coarse.

Texture: Porphyroclastic.

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	0	80-88			
Orthopyroxene.	0	10-15	1-10	Anhedral.	No clear elongation.
ACCESSORY					
MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Clinopyroxene.	0	2-4	0.4-2.0	Anhedral.	Equant, occurs in aggregates.
Spinel.	1	2	0.1-2	Anhedral.	Reddish brown color. Shape fabric dipping at about 10°-20° in plane of thin section.
SECONDARY					
MINERAL NAME	PERCENT	REPLACING/ FILLING	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Serpentine.	95	Olivine, orthopyroxene.		Mesh.	Has a dominant set of anastomosing microcracks dipping at 45°-50° in plane of thin section.
Iron oxide minerals.	4	Olivine, spinel.			
Clay minerals.	Trace.				Occurs with serpentine.

COMMENTS: #87 and #88

Note there are two thin sections for this sample. The section described is #87. Section #88 contains approximately 10% fresh olivine, orthopyroxene, and clinopyroxene. These thin sections are oriented.

STRUCTURE

Well-developed mesh texture. Moderate development of the anastomosing foliation.

Bastites found as large porphyroclasts that are partly recrystallized. Spinel elongation and anastomosing serpentine fabric has an angle of 70°-90°.

153-920D-11R-3 (Piece 9, 104 cm)

Observer: ROS

Rock Name: SERPENTINIZED HARZBURGITE

Grain size: Coarse.

Texture: Porphyroclastic, locally mylonitic.

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	10	75	0.1-1.0	Anhedral.	Kink bands in large grains; neoblasts.
Orthopyroxene.	15	20	1-4.5	Anhedral.	Elongate, porphyroclastic. Contains exsolution of clinopyroxene.
ACCESSORY					
MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Clinopyroxene.	3	3-4	0.3-1.5	Anhedral.	Strained, recrystallized. Contains exsolution of orthopyroxene.
Spinel.	=1	1.2	0.2-0.5	Anhedral.	
SECONDARY					
MINERAL NAME	PERCENT	REPLACING/ FILLING	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Serpentine.	75	Olivine and orthopyroxene.	<1		Mesh textured; bastite pseudomorphs after orthopyroxene.
Iron oxide minerals.	3	Olivine, orthopyroxene.	0.1-0.5		
Ferrit-chromite.	<1	Spinel.	<1		
Hornblende.	<1	Clinopyroxene.	0.1-0.3		Hornblende, pleochroic in brown to yellow.
Chlorite.	<1	?	<1		
VEIN/FRACTURE					
FILLING	PERCENT	PERCENT ORIGINAL	SIZE (mm)	ORIENTATION	DESCRIPTION
Serpentine.			<4		Has a radiating acicular mineral lining the vein; serpentine veins form up to 15% of the rock.

COMMENTS: #89

STRUCTURE

Complex vein patterns and associated alteration. Development of anastomosing vein set oblique (45°, dextral) to the earlier shear zones. Anastomosing veins are consistently oriented in olivine-rich zones but are concentric about bastite. Relict mylonite zones found parallel to the long axis of the thin section and parallel to bastite elongations. Dextral shear (?) based on asymmetric tails on bastite. Olivine found as large recovered or weakly strained crystals and as fine-grained aggregates. Mortar texture locally developed. Bastite strongly kinked and elongate. Margins of porphyroclasts are well defined with recrystallized tails.

SITE 920

153-920D-12R-2 (Piece 11, 119 cm)

Observer: PAM

Rock Name: SERPENTINIZED HARZBURGITE

Grain size: Coarse.

Texture: Porphyroclastic.

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	3.5	82.5	0.5-2.5		Preserved in the cores of serpentine mesh, adjacent to orthopyroxene porphyroclasts.
Orthopyroxene.	10	18	0.1-15		Contains exsolution of clinopyroxene; has wavy extinction due to slight deformation.
ACCESSORY MINERAL NAME					
Clinopyroxene.	<1	<1			Occurs only as exsolution from orthopyroxene.
Spinel.	Trace.	Trace.	<0.2	Anhedral.	Golden brown color.
SECONDARY MINERAL NAME					
Serpentine.	81	REPLACING/ FILLING Olivine, orthopyroxene.			Bastite after orthopyroxene; mesh texture after olivine.
Iron oxide minerals.	1	Olivine.			
Clay minerals.	<<1				
VEIN/FRACTURE FILLING					
Carbonate minerals.	PERCENT		SIZE	ORIENTATION	
Serpentine and iron oxide minerals.			0.1		
			0.1-0.8		

COMMENTS: #90 and #91

Note there are two thin sections of this sample and both are similar. One orthopyroxene porphyroclast is crosscut by "veins" (fracture-filling?) of clinopyroxene oriented oblique to the exsolution lamellae.

STRUCTURE

Anastomosing vein foliation is heterogeneously developed. Weakly developed foliation occurs along margins of bastite. Bastite is kinked, dynamically recrystallized, and has pressure shadows of coarsely crystalline olivine.

153-920D-12R-3 (Piece 5, 93 cm)

Observer: PAM

Rock Name: OXIDE METAGABBRO

Grain size: Very coarse/pegmatitic

Texture: Equigranular.

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Plagioclase.	20	40	<15	Anhedral to subhedral.	Usually occurs as space-filling between clinopyroxene, but some original larger crystals may have had rational crystal faces.
Clinopyroxene.	48	50	<20	Anhedral.	Some recrystallization at grain boundaries.
Iron oxide minerals.	10	10	1-8	Anhedral.	
ACCESSORY MINERAL NAME					
Orthopyroxene.	<1	0	<1	Anhedral.	Occurs only as exsolution from clinopyroxene.
Amphibole.	1	?	?	Anhedral.	Possibly late-stage magmatic. Occurs interstitially, rimming and replacing clinopyroxene.
SECONDARY MINERAL NAME					
Prehnite.	13	REPLACING/ FILLING Plagioclase/veins.	<2	Anhedral.	Often exhibits a radiating habit.
Second. plagioclase.	3	Plagioclase.		Anhedral.	
Actinolite.	<1	Clinopyroxene.		Subhedral.	
Chlorite.	4	Plagioclase.		Anhedral.	
VEIN/FRACTURE FILLING					
Prehnite.	PERCENT		SIZE	ORIENTATION	
	2				The vein makes up <3% of slide.

COMMENTS: #92

STRUCTURE

Undeformed pegmatitic oxide gabbro.

153-920D-12R-5 (Piece 3, 23 cm)
 Rock Name: SERPENTINIZED HARZBURGITE
 Grain size: Coarse.
 Texture: Porphyroclastic.

Observer: PAM

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	0	75	?	?	
Orthopyroxene.	0	25	1-8	Anhedral.	
ACCESSORY MINERAL NAME					
Spinel.	Trace.	Trace.		Anhedral.	Golden brown; black oxidized rims probably ferrit chromite.
SECONDARY MINERAL NAME					
Serpentine.	99	REPLACING/ FILLING Olivine, orthopyroxene.			Mesh texture after olivine; bastite pseudomorphs after orthopyroxene.
Iron oxide minerals.	1	Olivine.			
Clay minerals.	Trace.	In veins.			
VEIN/FRACTURE FILLING					
Serpentine and clay minerals.	PERCENT <1		SIZE	ORIENTATION	The rock contains <1% veins.

COMMENTS: #93 and # 94

Note there are two thin sections from the same sample. The presence of clinopyroxene cannot be determined due to the degree of alteration.

STRUCTURE

Anastomosing foliation is strongly developed. Bastite is elongate.

153-920D-12R-5 (Piece 6, 49 cm)
 Rock Name: SERPENTINIZED HARZBURGITE
 Grain size: Coarse.
 Texture: Porphyroclastic.

Observer: PAM

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	1	90.5	<3	?	
Orthopyroxene.	0	8	<10	Anhedral.	Recrystallized(?), occurring in clusters similar to clinopyroxene.
ACCESSORY MINERAL NAME					
Clinopyroxene.	1	1	<4	Anhedral.	Recrystallized(?), occurring as clusters of grains, individuals crystal are <1mm in size. Clusters up to 4 mm across.
Spinel.	0.5	0.5	0.6-1.5	Anhedral.	Golden to reddish brown in color. Occurs in clusters with pyroxene. Spinel elongate perpendicular to the current dominant fabric.
SECONDARY MINERAL NAME					
Serpentine.	97	REPLACING/ FILLING Olivine and orthopyroxene.			Mesh texture after olivine.
Iron oxide minerals.	0.5	Olivine			
Clay minerals.	Trace.	In veins.			
VEIN/FRACTURE FILLING					
Serpentine. Clay minerals and serpentine.	PERCENT		SIZE	ORIENTATION	Some cross fiber. Thin veinlets.

COMMENTS: #95

Note this slide is badly plucked during preparation in areas where there is fresh olivine, so abundance is difficult to estimate.

STRUCTURE

Anastomosing foliation is moderately developed. Bastite is plucked from slide but outlines of grains are strongly elongate. Spinel trails occur at a high angle to both of the above fabrics.

153-920D-14R-2 (Piece 4B, 52 cm)

Observer: KIY

Rock Name: SERPENTINIZED HARZBURGITE

Grain size: Coarse.

Texture: Porphyroclastic.

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	25	89	0.1-2.5	Anhedral.	
Orthopyroxene.	6	9	0.1-5.5	Anhedral.	
ACCESSORY					
MINERAL NAME					
Clinopyroxene.	1	1	0.05-0.8	Anhedral.	
Spinel.	<1	<1	0.05-1.4	Anhedral.	Light yellowish-brown
SECONDARY					
MINERAL NAME	PERCENT	REPLACING/ FILLING			
Serpentine.	66	Olivine and orthopyroxene.			
Iron oxide minerals.	1	Olivine.			
VEIN/FRACTURE					
FILLING	PERCENT		SIZE	ORIENTATION	
Serpentine and clay minerals.	0.1				

COMMENTS: #96

Spinel trails traceable up to 5 mm long. Note that the surface of this thin section is badly plucked in the areas of fresh olivines.

STRUCTURE

Anastomosing foliation is moderately to weakly developed. Where evident it is oriented tangent to the margins of bastite porphyroclasts.

153-920D-14R-3 (Piece 3, 82 cm)

Observer: PAM

Rock Name: SERPENTINIZED HARZBURGITE-LHERZOLITE

Grain size: Coarse.

Texture: Porphyroclastic.

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	20	75	<6	Anhedral.	
Orthopyroxene.	15	20	2-14	Anhedral.	Contains exsolution of clinopyroxene.
ACCESSORY					
MINERAL NAME					
Clinopyroxene.	3	5	0.2-1.5	Anhedral.	Recrystallized locally from larger grains?
Spinel.	<1	<1	<1	Anhedral.	Golden brown.
SECONDARY					
MINERAL NAME	PERCENT	REPLACING/ FILLING			
Serpentine.	61	Olivine and orthopyroxene.		Mesh.	
Iron oxide minerals.	<1	Olivine.			
Tremolite(?)	<1	In vein.			
VEIN/FRACTURE					
FILLING	PERCENT		SIZE	ORIENTATION	
Serpentine.			0.04-0.8		Veins form <<1% of the rock.

COMMENTS: #97 and #98

STRUCTURE

Most pyroxenes in the slide are roughly equant in shape, but one slide has a strongly elongated crystal with an aspect ratio of sample 3:1. The crystal is crosscut by serpentine veinlets that are perpendicular to the direction of elongation. Anastomosing foliation is moderately developed but the fibers in mesh textured serpentine are strongly aligned. Primary minerals are coarse-grained and show little sign of internal strain. Bastite is highly elongate (parallel to the anastomosing foliation). Orthopyroxenes are commonly clustered and strained.

153-920D-14R-3 (Piece 4B, 139 cm)
 Rock Name: SERPENTINIZED DUNITE
 Grain size: Coarse.
 Texture: Equigranular.

Observer: KIY

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	1	91	0.2-2.2	Anhedral.	
ACCESSORY MINERAL NAME					
Orthopyroxene.	1	7	0.1-7.5	Anhedral.	
Clinopyroxene.	1	1	0.05-3.2	Anhedral.	
Spinel.	1	1	0.05-1	Anhedral.	Color: brown (slightly yellowish). Occurs in trails up to 4 mm long.
SECONDARY MINERAL NAME					
Serpentine.	90	REPLACING/ FILLING Olivine/pyroxene.			
Magnetite.	2				
Chlorite.	2	Bastite and rimming spinel.			
VEIN/FRACTURE FILLING					
Serpentine.	0.1		SIZE	ORIENTATION	

COMMENTS: #99

STRUCTURE

Anastomosing foliation is strongly developed. Bastite is strongly elongate parallel to anastomosing foliation. Olivine is coarse grained with little intracrystalline deformation features.

153-920D-14R-3 (Piece 4B, 143 cm)
 Rock Name: SERPENTINIZED HARZBURGITE
 Grain size: Coarse.
 Texture: Porphyroclastic.

Observer: KIY

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	3	88	0.1-2.4	Anhedral.	Granular.
Orthopyroxene.	4	8	0.1-8.8	Anhedral.	
ACCESSORY MINERAL NAME					
Clinopyroxene.	1-2	3	0.1-2.5	Anhedral.	Replaced by chlorite ± talc.
Spinel.	1	1	0.05-0.9	Anhedral.	Yellowish-brown in color.
SECONDARY MINERAL NAME					
Serpentine.	84	REPLACING/ FILLING Olivine and orthopyroxene.			
Magnetite.	2	Olivine.			
Talc.	2	Bastite and clinopyroxene.			
Chlorite.	2	Bastite and clinopyroxene.			
VEIN/FRACTURE FILLING					
Tremolite and talc.			SIZE	ORIENTATION	
Serpentine.					
Serpentine and talc.					

COMMENTS: #100

STRUCTURE

Anastomosing foliation is particularly well developed. It is crosscut by a later vein filled with fibrous serpentine. Fiber orientation (normal to the vein wall) indicates that no shear movement has taken place along this vein. Olivine grain size ranges from medium (around 1 mm) to fine (a few hundred micrometers). Fine grains show a poorly recovered substructure and well-developed subgrain boundaries. Orthopyroxene crystals are elongated and slightly twisted.

SITE 920

153-920D-14R-5 (Piece 5, 75 cm)

Observer: JFC

Rock Name: SERPENTINIZED HARZBURGITTE

Grain size: Coarse.

Texture: Porphyroclastic.

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	10	72	0.5-2	Anhedral.	Generally fine grained.
Orthopyroxene.	20	26	0.9-4.0	Anhedral.	Porphyroclasts and recrystallized grains.
ACCESSORY					
MINERAL NAME	PERCENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Clinopyroxene.	2	2	0.4-1.0	Anhedral.	
Spinel.	<1	<1	0.8-2.5	Anhedral.	Spinel in trains perpendicular to foliation.
SECONDARY					
MINERAL NAME	PERCENT	REPLACING/ FILLING			
Serpentine.	67	Olivine and orthopyroxene.			
Iron oxide minerals.	1	Olivine, orthopyroxene and spinel.			
VEIN/FRACTURE FILLING					
FILLING	PERCENT	SIZE	ORIENTATION		
Serpentine and clay minerals.					

COMMENTS: #101

Orthopyroxene porphyroclasts have recrystallized in places. High modal pyroxene occurs in this sample. Sample has strong development of anastomosing asbestiform white serpentine veins that wrap around the porphyroclasts.

STRUCTURE

V2 veins are well developed. Bastite shows strong dynamic recrystallization. Olivine is coarse grained and highly recovered.

153-920D-15R-3 (Piece 2B, 40 cm)

Observer: KIY

Rock Name: SERPENTINIZED HARZBURGITTE

Grain size: Coarse.

Texture: Porphyroclastic.

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	2	87	0.1-2.6	Anhedral.	Granular.
Orthopyroxene.	2	10	0.2-6.6	Anhedral.	Elongate.
ACCESSORY					
MINERAL NAME	PERCENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Clinopyroxene.	1	2	0.1-1.8	Anhedral.	
Spinel.	1	1	0.05-2.4	Anhedral.	Spinel trails can be traced more than 1.5 cm.
SECONDARY					
MINERAL NAME	PERCENT	REPLACING/ FILLING			
Serpentine.	84	Olivine/orthopyroxene.			
Chlorite.	2	Bastite/clinopyroxene.			
Talc.	4	Bastite.			
VEIN/FRACTURE FILLING					
FILLING	PERCENT	SIZE	ORIENTATION		
Serpentine.	1	0.5			
Tremolite.		1.5			In pods.
Chlorite.	0.5				High angle to foliation.

COMMENTS: #102

STRUCTURE

Spinel-rich horizons are oriented at a high angle to the anastomosing foliation and a weak porphyroclast elongation.

153-920D-15R-3 (Piece 3, 48 cm)

Observer: KIY

Rock Name: SERPENTINIZED HARZBURGITE

Grain size: Coarse.

Texture: Porphyroclastic.

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	3	80	0.1-3.5	Anhedral.	
Orthopyroxene.	0	17	0.2-6.5	Anhedral.	

ACCESSORY MINERAL NAME

Clinopyroxene.	0.5	2	0.1-1.2		
Spinel.	0.5	1	0.05-1.2		

SECONDARY MINERAL NAME

SECONDARY MINERAL NAME	PERCENT	REPLACING/ FILLING
Serpentine.	80	Olivine/orthopyroxene.
Magnetite.	2	
Chlorite.	6	Bastite/clinopyroxene.
Tremolite.	8	Bastite/clinopyroxene.

VEIN/FRACTURE

FILLING	PERCENT	SIZE	ORIENTATION
Serpentine with a small amount of clay minerals.			

COMMENTS: #103 and #104

Two thin sections from the same sample. #104 contains a contact with a meta-clinopyroxenite, completely altered to tremolite and chlorite.

STRUCTURE

Anastomosing foliation poorly developed. Primary minerals are coarse grained with no strong preferred elongation.

153-920D-15R-4 (Piece 1, 27 cm)

Observer: KIY

Rock Name: SERPENTINIZED HARZBURGITE

Grain size: Coarse.

Texture: Porphyroclastic.

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	3	83	0.05	Anhedral.	
Orthopyroxene.	8	14	0.2-6.4	Anhedral.	

ACCESSORY MINERAL NAME

Clinopyroxene.	2	2	0.1-3.5	Irregular.	
Spinel.	<1	<1	0.05-1.2	Anhedral.	Yellowish brown colored. Interstitial habit.

SECONDARY MINERAL NAME

SECONDARY MINERAL NAME	PERCENT	REPLACING/ FILLING
Serpentine.	80	Olivine/orthopyroxene.
Magnetite.	2	
Chlorite.	2	
Talc.	2	Bastite.

VEIN/FRACTURE

FILLING	PERCENT	SIZE	ORIENTATION
Serpentine and clay minerals.		<0.3	

COMMENTS: #105

Porphyroclasts are orthopyroxene, clinopyroxene, and olivine. Clinopyroxene abundance is high only around orthopyroxene.

STRUCTURE

Anastomosing foliation is well developed and congruent with the porphyroclast elongation. Porphyroclasts are commonly composed of a single mineral phase that is strongly dynamically recrystallized, though multiphase porphyroclasts occur locally.

SITE 920

153-920D-15R-5 (Piece 7, 64 cm)

Observer: HW

Rock Name: SERPENTINIZED HARZBURGITE

Grain size: Coarse.

Texture: Porphyroclastic.

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	5	82	0.2-2.0	Anhedral.	Undulatory extinction.
Orthopyroxene.	5	15	0.5-2.6	Anhedral.	
Spinel	0.1	1	0.3-0.5		
ACCESSORY MINERAL NAME					
Clinopyroxene.	2	2	0.2-2.0	Anhedral.	Clusters of grains, neoblasts. Clinopyroxene relics are separated by tremolite and chlorite.
Spinel.	0.1	1	0.3-0.5		
SECONDARY MINERAL NAME					
Serpentine.	80	REPLACING/ FILLING Olivine/orthopyroxene.		Mesh.	Bastite after orthopyroxene.
Magnetite.	3	Associated with serpentine.			
VEIN/FRACTURE FILLING					
Serpentine, talc, tremolite, and chlorite	PERCENT 5-10		SIZE 0.1-0.6	ORIENTATION	A 7 mm vein is a composite of these phases and includes zircon. Also surrounds relatively larger grains of actinolite.

COMMENTS: #106

STRUCTURE

Anastomosing foliation moderately developed. Primary minerals are coarse-grained and recovered. Olivine shows weak development of subgrains with straight low-angle boundaries.

153-920D-16R-1 (Piece C, 98 cm)

Observer: ROS

Rock Name: SERPENTINIZED HARZBURGITE

Grain size: Coarse.

Texture: Porphyroclastic.

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	10	79	0.2-3.0	Anhedral.	
Orthopyroxene.	10	16	0.4-4.0	Anhedral.	Contains exsolution of clinopyroxene.
ACCESSORY MINERAL NAME					
Clinopyroxene.	3	4	0.2-1.6	Anhedral.	Contains exsolution of orthopyroxene.
Spinel.	1	1	0.2-1.6	Anhedral.	Reddish-brown.
SECONDARY MINERAL NAME					
Serpentine.	PERCENT 74	REPLACING/ FILLING Olivine and orthopyroxene.	<1		Mesh texture after olivine; bastite pseudomorphs after orthopyroxene.
Sulfide minerals.	<0.5				Could be primary; occurs as clusters of pale yellow and gray crystals in reflected light.
Magnetite.	≈2				
VEIN/FRACTURE FILLING					
Serpentine.	PERCENT		SIZE 0.2-0.4	ORIENTATION	Occurs subparallel to pyroxene elongation. Serpentine is fibrous perpendicular to long axis of the vein. Veins form about 5% of the rock.

COMMENTS: #107 and #108

All primary minerals are strained and have undulatory extinction. All are elongated with neoblasts.

STRUCTURE

Anastomosing foliation moderately developed. Porphyroclasts are polymineralic. One bastite porphyroclast is cut by a vein. Olivine shows weak development of subgrains with straight low-angle boundaries.

153-920D-16R-6 (Piece 10, 76 cm)
 Rock Name: SERPENTINIZED HARZBURGITE
 Grain size: Coarse.
 Texture: Porphyroclastic.

Observer: ROS

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	41	85	0.2-0.4	Anhedral.	
Orthopyroxene.	8	12	0.4-4.0	Anhedral.	
ACCESSORY MINERAL NAME					
Clinopyroxene.	1	1	0.4	Anhedral.	
Spinel.	0.5	1	0.2-1.0	Anhedral.	Rimmed by black opaque ferrite-chromite?
SECONDARY MINERAL NAME					
Serpentine.	45	REPLACING/ FILLING Olivine/orthopyroxene.			Mesh-textured and bastite pseudomorphs after orthopyroxene.
Ferrite-chromite.	<1	Spinel.			
Magnetite.	3	Olivine.			
Cummingtonite.	1	Orthopyroxene.			
VEIN/FRACTURE FILLING					
Hornblende.	PERCENT		SIZE	ORIENTATION	
Prehnite.					

COMMENTS: #109

Olivine-rich zone is cut by a 6-mm-wide composite vein with a core containing well-developed 4-mm-wide, zoned amphiboles with pale brown-colored cores and colorless rims. Grain boundaries are ragged due to replacement by very fine-grained oxide minerals, with rare chlorite. Associated pods contain granular epidote intergrown with blue gray green-colored sheaves of antigorite(?). The amphibole core is symmetrically rimmed by flaky, colorless chlorite intergrown with clay minerals, serpentine(?), and localized pods of prehnite after plagioclase(?). The bounding wall rock is pervasively altered with adjacent olivine being highly fractured and replaced by talc, colorless amphibole, serpentine, and iron oxide minerals. Orthopyroxenes are rimmed by fibrous, fine, colorless amphibole (cummingtonite), and serpentine. Away from the vein, olivine crystals are relatively fresh. The amphibole vein cuts a 2-mm-wide serpentine and clay mineral vein at 90°, and both are cut by a fine vein of serpentine. Complex serpentine veinlets adjacent to olivine-rich zones contain concentrated bands of brucite.

STRUCTURE

Incipient anastomosing foliation. Primary minerals are coarse grained and free of deformation features. Olivine shows weak grain elongation perpendicular to anastomosing vein fabric. Dislocation walls are perpendicular to grain elongation. An amphibole-bearing vein crosscuts a serpentine vein and is itself crosscut by later veins of serpentine.

153-920D-16R-7 (Piece 6, 54 cm)
 Rock Name: SERPENTINIZED HARZBURGITE
 Grain size: Coarse.
 Texture: Porphyroclastic.

Observer: NOR

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	1	90			
Orthopyroxene.	2	10	1-7	Anhedral.	
ACCESSORY MINERAL NAME					
Clinopyroxene.	<1	<1	0.1-0.5	Anhedral.	Exsolution in orthopyroxene.
Spinel.	<1	<1	0.1-0.7	Anhedral.	Yellowish brown.
SECONDARY MINERAL NAME					
Serpentine.	94	REPLACING/ FILLING Olivine/orthopyroxene.			
Iron oxide minerals.	2	Olivine/orthopyroxene/spinel.			
Chlorite.					
VEIN/FRACTURE FILLING					
Serpentine and clay minerals.	PERCENT		SIZE	ORIENTATION	

COMMENTS: #110 and #111

STRUCTURE

Anastomosing foliation well developed. Bastite shows lattice bending and kinking and dynamic recrystallization. Grains are elongate parallel to anastomosing foliation.

153-920D-17R-1 (Piece 4, 46 cm)

Observer: HW

Rock Name: SERPENTINIZED HARZBRUGITE AND METAPYROXENITE

Grain size: Coarse.

Texture: Porphyroclastic.

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	0	80			
Orthopyroxene.	3	15	4	Anhedral.	
ACCESSORY					
MINERAL NAME					
Clinopyroxene.	4	4	1-3	Anhedral.	Aligned along trails.
Spinel.	1	1	1.5-1	Anhedral.	Aligned along trails. Has overgrowths of magnetite.
SECONDARY					
MINERAL NAME	PERCENT	REPLACING/ FILLING			
Tremolite.	28	Olivine, orthopyroxene, and clinopyroxene.			
Talc.	44	Olivine, orthopyroxene, and clinopyroxene.			
Serpentine.	16	Olivine, orthopyroxene, and clinopyroxene.			
Chlorite.	4	Olivine, orthopyroxene, and clinopyroxene.			
VEIN/FRACTURE					
FILLING	PERCENT		SIZE	ORIENTATION	
Serpentine.			0.3		

COMMENTS: #112

The pyroxenite portion of the rock originally contained 97% clinopyroxene, only 5% of which is remaining. The pyroxenite has altered to tremolite and cummingtonite (=75%), and 20% chlorite. The tremolite is fibrous in appearance; the cummingtonite is well formed, pale brown in color with a high extinction angle. It contains an irregular distribution of the minerals. At the contact with the peridotite the amphibole is cummingtonite and away from this contact the amphibole is tremolite, occurring in radiating clusters with chlorite. Proportions of original minerals difficult to assess.

STRUCTURE

Alteration obscures fabric.

153-920D-17R-3 (Piece 1C, 37 cm)

Observer: NOR

Rock Name: SERPENTINIZED HARZBURGITE

Grain size: Coarse.

Texture: Porphyroclastic.

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	1	90			Kink bands.
Orthopyroxene.	2	10	0.2-10	Anhedral.	
ACCESSORY					
MINERAL NAME					
Clinopyroxene.	<<1	<<1	0.1-2.0	Anhedral.	Occurs as exsolution lamellae in orthopyroxene.
Spinel.	<1	<1	0.1-0.5	Anhedral.	
SECONDARY					
MINERAL NAME	PERCENT	REPLACING/ FILLING			
Serpentine.	90	Olivine and orthopyroxene.			
Iron oxide minerals.	2	Olivine and orthopyroxene.			
Talc.	<1	Orthopyroxene.			
Clay minerals.	5	Orthopyroxene.			
VEIN/FRACTURE					
FILLING	PERCENT		SIZE	ORIENTATION	
Serpentine, tremolite, and clay minerals.					

COMMENTS: #113 and #114

STRUCTURE

Anastomosing foliation is moderate. Bastite is dynamically recrystallized and elongate.

153-920D-18R-2 (Piece 9, 74 cm)

Observer: KIY

Rock Name: SERPENTINIZED HARZBURGITE

Grain size: Coarse.

Texture: Porphyroclastic.

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	1	88	0.1-1.8	Anhedral.	
Orthopyroxene.	3	10	0.1-7.5	Anhedral.	
ACCESSORY MINERAL NAME					
Clinopyroxene.	0.5	0.5-1	0.05-0.6	Anhedral.	
Spinel.	1	1	0.05-2.4	Anhedral.	Color: yellowish brown.
SECONDARY MINERAL NAME					
Serpentine.	98	REPLACING/ FILLING Olivine/orthopyroxene.			
Magnetite.	2	Olivine.			
VEIN/FRACTURE FILLING					
Serpentine, magnetite, chlorite.	PERCENT		SIZE 2 mm	ORIENTATION	

COMMENTS: #115

STRUCTURE

Anastomosing foliation is strong and wraps around bastite. The 2 mm vein is crosscut by the fine-grained serpentine veins.

153-920D-18R-3 (Piece 4, 75 cm)

Observer: KIY

Rock Name: SERPENTINIZED HARZBURGITE

Grain size: Coarse.

Texture: Porphyroclastic.

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine	2	77	0.2-3.5		
Orthopyroxene	4	22	0.6-10	Elongate.	
ACCESSORY MINERAL NAME					
Spinel.	1	1	0.2-2.0	Anhedral, elongate.	Spinel train direction is aligned with large elongate orthopyroxene. Spinels are surrounded by bastite pseudomorphs after orthopyroxene.
SECONDARY MINERAL NAME					
Serpentine.	PERCENT	REPLACING/ FILLING Olivine/ orthopyroxene	<1		
Magnetite.			<0.5		
VEIN/FRACTURE FILLING					
Serpentine.	PERCENT		SIZE 0.2-0.6	ORIENTATION Two sets.	Parallel and perpendicular to the foliation.

COMMENTS: #116 and #117

STRUCTURE

Anastomosing foliation is moderately to well defined. Bastite porphyroclasts are both equant and highly elongate.

SITE 920

153-920D-19R-2 (Piece 1, 13 cm)

Rock Name: SERPENTINIZED HARZBURGITE

Grain size: Coarse.

Texture: Porphyroclastic.

Observer: ROS

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	3-5	75	0.4-2.0	Anhedral.	
Orthopyroxene.	14	22	0.2-4.0	Anhedral.	
ACCESSORY MINERAL NAME					
Clinopyroxene.	2	2	0.4-1.0	Anhedral.	Cluster of recrystallized grains. Clinopyroxene relics with olivine and orthopyroxene in clusters of recrystallized grains. Clinopyroxene relics with olivine and orthopyroxene in clusters of recrystallized grains. Holly-leaf grains.
Spinel.	1	1	0.6-3.0	Anhedral.	
SECONDARY MINERAL NAME					
Serpentine.	PERCENT 74	REPLACING/ FILLING Olivine/ orthopyroxene.	<0.2	Fibrous.	
Magnetite.	2-3	Olivine.	<0.5	Anhedral.	In serpentine veins.
Chlorite.	1				
VEIN/FRACTURE FILLING					
Serpentine.	PERCENT		SIZE <0.2	ORIENTATION	

COMMENTS: #118 and #119

STRUCTURE

Anastomosing vein foliation is moderately defined. Bastite porphyroclasts show lattice bending and kinking and dynamic recrystallization. Relics of primary minerals show undulose extinction.

153-920D-20R-1 (Piece 4, 14 cm)

Rock Name: METACLINOPYROXENITE

Grain size: Coarse.

Texture: Equigranular.

Observer: HW

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Clinopyroxene.	12	93	2-4	Anhedral.	
Orthopyroxene.	1	5	4	Anhedral.	
ACCESSORY MINERAL NAME					
Apatite.	1	2	2-3	Anhedral.	Slightly poikilitic, including amphibole along margins. Contains fluid inclusions.
SECONDARY MINERAL NAME					
Amphibole.	PERCENT 80	REPLACING/ FILLING Clinopyroxene, orthopyroxene.	1-3	Euhedral.	Tremolite and cummingtonite?
Chlorite.	5				
VEIN/FRACTURE FILLING					
Epidote, clinozoisite.	PERCENT		SIZE 1	ORIENTATION	

COMMENTS: #120

Sample does not include contact with the wall-rock and extensive formation of secondary minerals almost completely obscures the primary mineralogy with alteration reaching 90%. Rare anhedral grains of amphibolitized clinopyroxene are enclosed in subradiating aggregates of prismatic and columnar sprays of tremolite-actinolite, which commonly exhibit dusty margins.

Medium-grained, rounded, anhedral, highly strained apatite grains are partially overgrown by amphibole and exhibit subgrain development and embayed grain boundaries. Primary liquid dominated fluid inclusions within the apatite exhibit negative crystal habits and contain daughter minerals of halite.

STRUCTURE

Undeformed.

153-920D-20R-1 (Piece 13B, 103 cm)

Observer: ROS

Rock Name: SERPENTINIZED HARZBURGITE

Grain size: Medium.

Texture: Porphyroclastic.

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	67	80	0.2-3.0	Anhedral.	Has kink bands and undulatory extinction.
Orthopyroxene.	9	15	0.2-3.8	Anhedral.	Elongate to equant shape. Aspect ratio from 1:1 to 4:1. Contains exsolution of clinopyroxene; some crystals are recrystallized, occurring in clusters.
ACCESSORY MINERAL NAME					
Clinopyroxene.	1	3-4	0.2-1.4	Anhedral.	Crystals are strained and have undulatory extinction in some cases. Contains exsolution of orthopyroxene; some crystals are recrystallized and occur in clusters.
Spinel.	1.5	1.5	0.2-1.2	Anhedral.	Elongate, holly-leaf shapes; altered to dark rims, probably ferrit-chromite.
SECONDARY MINERAL NAME	PERCENT	REPLACING/ FILLING	SIZE	MORPHOLOGY	DESCRIPTION
Serpentine.	80	Olivine and orthopyroxene.	<0.5		
Magnetite.	3	Olivine.	<2	Anhedral.	Occurs in small serpentine veins after olivine.
Sulfide minerals.	<1			Anhedral.	Cluster of two sulfides, gray and gold, could be primary.
Chlorite.	Trace.	Serpentine.			Occurs after serpentine in the cores of mesh structures.
VEIN/FRACTURE FILLING	PERCENT		SIZE	ORIENTATION	DESCRIPTION
Serpentine and iron oxide minerals.			0.1-0.3		One set subparallel to pyroxene elongation; a second set subperpendicular to the elongation. Veins form less than 2% of the sample.

COMMENTS: #121 and #122

A clinopyroxene trail (now composed of relict clinopyroxene + tremolite) occurs crosscutting orthopyroxene, subperpendicular to the elongation; fresh in the augen, but altered in the more serpentinized areas.

STRUCTURE

Anastomosing vein foliation is moderately defined. Primary phases are dynamically recrystallized.

153-920D-20R-2 (Piece 1B, 27 cm)

Observer: PAM

Rock Name: SERPENTINIZED HARZBURGITE

Grain size: Coarse.

Texture: Porphyroclastic.

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	5	85	<4	Anhedral.	
Orthopyroxene.	5	13	2-10	Anhedral.	Contains exsolution of clinopyroxene; undulatory extinction; is slightly deformed.
ACCESSORY MINERAL NAME					
Clinopyroxene.	0.5	2.0	1-3.5	Anhedral.	Contains exsolution of orthopyroxene.
Spinel.	<1	<1	0.2-1.5	Anhedral.	Golden brown, holly-leaf shape; rims altered to black opaque oxide, probably ferrite-chromite; ferrit-chromite occurs in symplectite intergrowth with pyroxenes.
SECONDARY MINERAL NAME	PERCENT	REPLACING/ FILLING	SIZE	MORPHOLOGY	DESCRIPTION
Serpentine.	89	Olivine, orthopyroxene.			
Talc.	Trace.	Olivine, orthopyroxene.			
Clay minerals.	Trace.	Clinopyroxene and in veins.			
VEIN/FRACTURE FILLING	PERCENT		SIZE	ORIENTATION	DESCRIPTION
Serpentine and iron oxide minerals ± clay minerals.			0.1-1.5		Veins form <1% of the sample.

COMMENTS: #123 and #124

Spinel alignment oblique to apparent fabric.

STRUCTURE

Anastomosing vein foliation is moderately defined. Bastite pophroclasts show lattice bending and kinking and dynamic recrystallization.

SITE 920

153-920D-20R-4 (Piece 2, 25 cm)

Observer: KIY

Rock Name: SERPENTINIZED HARZBURGITE

Grain size: Coarse.

Texture: Porphyroclastic.

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	3	78	0.1-3.4	Anhedral.	Elongated.
Orthopyroxene.	10	18	0.2-8.2	Anhedral.	Slightly elongated.
ACCESSORY					
MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Clinopyroxene.	1	3	0.2-2.0	Anhedral.	
Spinel.	0.5	1	0.05-1.8	Anhedral.	Color: yellowish brown. Spinel trails (10 mm long) cut orthopyroxene porphyroclasts.
SECONDARY					
MINERAL NAME	PERCENT	REPLACING/ FILLING			DESCRIPTION
Serpentine.	81	Olivine and orthopyroxene.			Mesh texture after olivine, bastite pseudomorphs after orthopyroxene.
Magnetite.	2	After olivine.			In small serpentine veins.
Chlorite.	2	After clinopyroxene and bastite.			

VEIN/FRACTURE FILLING	PERCENT	SIZE	ORIENTATION
Serpentine.			

COMMENTS: #16L

STRUCTURE

Bastite is recrystallized and weakly elongated. Anastomosing vein fabric is moderately developed. Olivine is coarse grained and shows weak development of low-angle subgrain boundaries.

153-920D-20R-4 (Piece 3A, 38 cm)

Observer: HW

Rock Name: SERPENTINIZED HARZBURGITE

Grain size: Coarse.

Texture: Porphyroclastic.

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	2	88	0.5-1.5	Anhedral	(Subgrain)
Orthopyroxene.	2	12	3	Anhedral.	
ACCESSORY					
MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Spinel.	0.5	1	1.5	Elongated.	
SECONDARY					
MINERAL NAME	PERCENT	REPLACING/ FILLING			DESCRIPTION
Serpentine.	97	Olivine.			From olivine breakdown.
Magnetite.	1	Olivine.			From olivine breakdown.
VEIN/FRACTURE					
FILLING	PERCENT	SIZE	ORIENTATION		DESCRIPTION
Serpentine.	90	0.5			Serpentine veins occur parallel to the ribbon texture of serpentine. Includes magnetite stringers.
Talc (?)	10				

COMMENTS: #125 and #126

STRUCTURE

Mesh texture of serpentine is well developed. The few olivine relics exhibit no intracrystalline deformation structures. Bastite porphyroclasts show straight cleavages and no evidence of recrystallization.

153-920D-21R-2 (Piece 1C, 40 cm)

Observer: HW

Rock Name: SERPENTINIZED HARZBURGITE

Grain size: Coarse.

Texture: Porphyroclastic.

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	2	86	0.1-1	Anhedral.	
Orthopyroxene.	3	10	3	Anhedral.	Orthopyroxene occurs in clusters of 3 or 4 grains.
ACCESSORY MINERAL NAME					
Spinel.	0.5	1	1.5		Elongated. Included in orthopyroxene.
Clinopyroxene. slide #128.	2	3	2	Subhedral.	2% on a trail cut perpendicular to the thin section; 1% as residual phase observed in
SECONDARY MINERAL NAME					
	PERCENT	REPLACING/ FILLING			
Serpentine.	91	Olivine/orthopyroxene.			
Magnetite.	1.5	Olivine/orthopyroxene.			
VEIN/FRACTURE FILLING					
	PERCENT		SIZE	ORIENTATION	
Serpentine.					

COMMENTS: #127 and #128

STRUCTURE

Mesh texture of serpentine is well developed. The few olivine relics have close-spaced subgrain boundaries and undulose extinctions. Bastite porphyroclasts show evidence of kinks in previous orthopyroxene. Clinopyroxene is recrystallized.

153-920D-22R-2 (Piece 1D, 86 cm)

Observer: HW

Rock Name: SERPENTINIZED HARZBURGITE

Grain size: Coarse.

Texture: Porphyroclastic.

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Orthopyroxene.	12	13	10-40	Anhedral.	Moderately elongated. Some orthopyroxene porphyroclasts are round shaped and re-crystallized on their margins. Most of the orthopyroxene occurs in elongated
Olivine.	34	83	3-30	Anhedral.	clusters of recrystallized crystals together with clinopyroxene. Kink banded. Coarse-grained olivine in pressure shadows around orthopyroxene.
ACCESSORY MINERAL NAME					
Clinopyroxene.	3.2	2.5	1-3	Subhedral.	
Spinel.	1	1	0.5-1.0		Reddish-brown.
SECONDARY MINERAL NAME					
	PERCENT	REPLACING/ FILLING			
Serpentine.	47	Olivine and orthopyroxene.		Fibrous.	
Magnetite.	0.5	Olivine.			In serpentine veins.
VEIN/FRACTURE FILLING					
	PERCENT		SIZE	ORIENTATION	
Serpentine.			Up to 5 mm.		

COMMENTS: #129 and #130

STRUCTURE

Olivine has a well-developed, coarse-grained equigranular recrystallized texture. Grain size is commonly about 3 mm. A few olivine grains show undulose extinction and are recrystallized into a finer grained (several hundred micrometers) matrix.

SITE 920

153-920D-22R-4 (Piece 1B, 31 cm)

Observer: KIY

Rock Name: SERPENTINIZED HARZBURGITE

Grain size: Coarse.

Texture: Porphyroclastic.

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	15	85	0.1–5.5	Anhedral.	Granular.
Orthopyroxene.	7	9	0.1–7.2	Anhedral.	Slightly deformed.
ACCESSORY MINERAL NAME					
Clinopyroxene.	4	4	0.1–3.8	Anhedral.	Irregular, forming clusters.
Spinel.	2	2	0.05–2.8	Anhedral.	Irregular, brown.
SECONDARY MINERAL NAME					
Serpentine.	70	REPLACING/ FILLING Olivine, orthopyroxene.			
Magnetite.	2	Olivine.			
VEIN/FRACTURE FILLING					
Serpentine and actinolite.	PERCENT		SIZE	ORIENTATION	
Serpentine, chlorite, and carbonate minerals.			1.5		
Serpentine and magnetite.					

COMMENTS: #131

Coarse-grained equigranular texture with a large grain size. Clinopyroxene clusters, with minor interstitial orthopyroxene (4 x 16 mm) elongated, parallel to spinel trails, crosscutting the foliation at moderate angle (about 20°–30°). Beautiful spinel trails, more than 10 mm long.

STRUCTURE

Olivine has a well-developed, coarse-grained equigranular recrystallized texture. Grain size is commonly about 3 mm. Most olivine grains exhibit weak undulose extinction. Some orthopyroxene porphyroclasts are slightly twisted. Most of the orthopyroxene occurs in clusters of recrystallized crystals together with clinopyroxene.

153-920D-22R-5 (Piece 6B, 104 cm)

Observer: KIY

Rock Name: SERPENTINIZED HARZBURGITE

Grain size: Coarse.

Texture: Porphyroclastic.

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Orthopyroxene.	12	17	0.1–3.5	Anhedral.	Elongated, slightly deformed. Contains clinopyroxene exsolution.
Olivine.	3	80	0.1–3.6	Anhedral.	Granular. Preserved in orthopyroxene clusters.
ACCESSORY MINERAL NAME					
Clinopyroxene.	<2	2	0.1–1.8	Anhedral.	Angular-irregular. Clinopyroxene clusters (1 x 5 mm long).
Spinel.	0.4	0.4	0.05–0.8	Anhedral.	Interstitial; color: yellowish brown.
SECONDARY MINERAL NAME					
Chlorite.	0.9	REPLACING/ FILLING Clinopyroxene.			
Magnetite.	2	Olivine.			
Serpentine.	79	Olivine, orthopyroxene.			
VEIN/FRACTURE FILLING					
Serpentine.	PERCENT		SIZE	ORIENTATION	
Serpentine and sulfide minerals.					Crosscut by thinner serpentine veins.

COMMENTS: #132 and #133

STRUCTURE

Anastomosing foliation is well developed. Olivine is coarse grained (a few mm) and recrystallized. Orthopyroxene porphyroclasts are slightly twisted. Orthopyroxene occurs also in recrystallized clusters together with olivine.

153-920D-22R-5 (Piece 7, 129 cm)

Observer: ROS

Rock Name: METAGABBRO

Grain size: Pegmatitic.

Texture: Pegmatitic.

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Clinopyroxene.	15	25	5-15	Anhedral.	
Plagioclase.	10	35	5-10	Subhedral.	

ACCESSORY MINERAL NAME	PERCENT	PERCENT ORIGINAL	SIZE (mm)
Sulfide minerals.	0.5	0.5	0.2-0.6

SECONDARY MINERAL NAME	PERCENT	REPLACING/ FILLING
Chlorite.	5	Orthopyroxene.
Prehnite.	15	Plagioclase.
Clay minerals.	10	Plagioclase.
Tremolite.	10	Orthopyroxene/clinopyroxene.
Serpentine.	1	After olivine.

VEIN/FRACTURE FILLING	PERCENT	SIZE	ORIENTATION
Chlorite and clay minerals.			
Tremolite and serpentine.			

COMMENTS: #17L

STRUCTURE

Olivine amphibole gabbro. Original texture well preserved. Alignment of secondary tremolite in one grain is a consequence of overgrowing clinopyroxene cleavage not deformation. Local kink folding.

153-920D-22R-7 (Piece 1, 16 cm)

Observer: KIY

Rock Name: SERPENTINIZED HARZBURGITE

Grain size: Coarse.

Texture: Porphyroclastic.

PRIMARY MINERAL NAME	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Olivine.	18	81	0.1-4.2	Anhedral	Granular.
Orthopyroxene.	11	15	0.2-9.5	Anhedral	Elongated-subrounded.

ACCESSORY MINERAL NAME	PERCENT	PERCENT ORIGINAL	SIZE (mm)	MORPHOLOGY	DESCRIPTION
Clinopyroxene.	2.5	3	0.1-3.1	Anhedral.	Interstitial, angular.
Spinel.	0.5	0.5	0.05-1.8	Anhedral.	Color: yellowish brown.

SECONDARY MINERAL NAME	PERCENT	REPLACING/ FILLING
Serpentine.	65	Olivine, orthopyroxene.
Magnetite.	2	Olivine.
Talc.	1	Orthopyroxene.

VEIN/FRACTURE FILLING	PERCENT	SIZE	ORIENTATION
Serpentine and magnetite.			

COMMENTS: #134

Coarse grained, almost protogranular texture; olivine inclusions in orthopyroxene, with remarkable recrystallization textures: 1) some interstitial clinopyroxene, 2) clusters of clinopyroxene around an orthopyroxene, 3) orthopyroxene and spinel intergrowth. Trails of interstitial clinopyroxene (0.1-3.1 mm in size) as long as 1 cm through the thin section.

STRUCTURE

Olivine shows strong preferred lattice fabric. Coarse-grained 3 mm equigranular mosaic. Commonly dynamically recrystallized to smaller subgrains. Orthopyroxene found as large clusters of recrystallized grains, commonly associated with clinopyroxene.