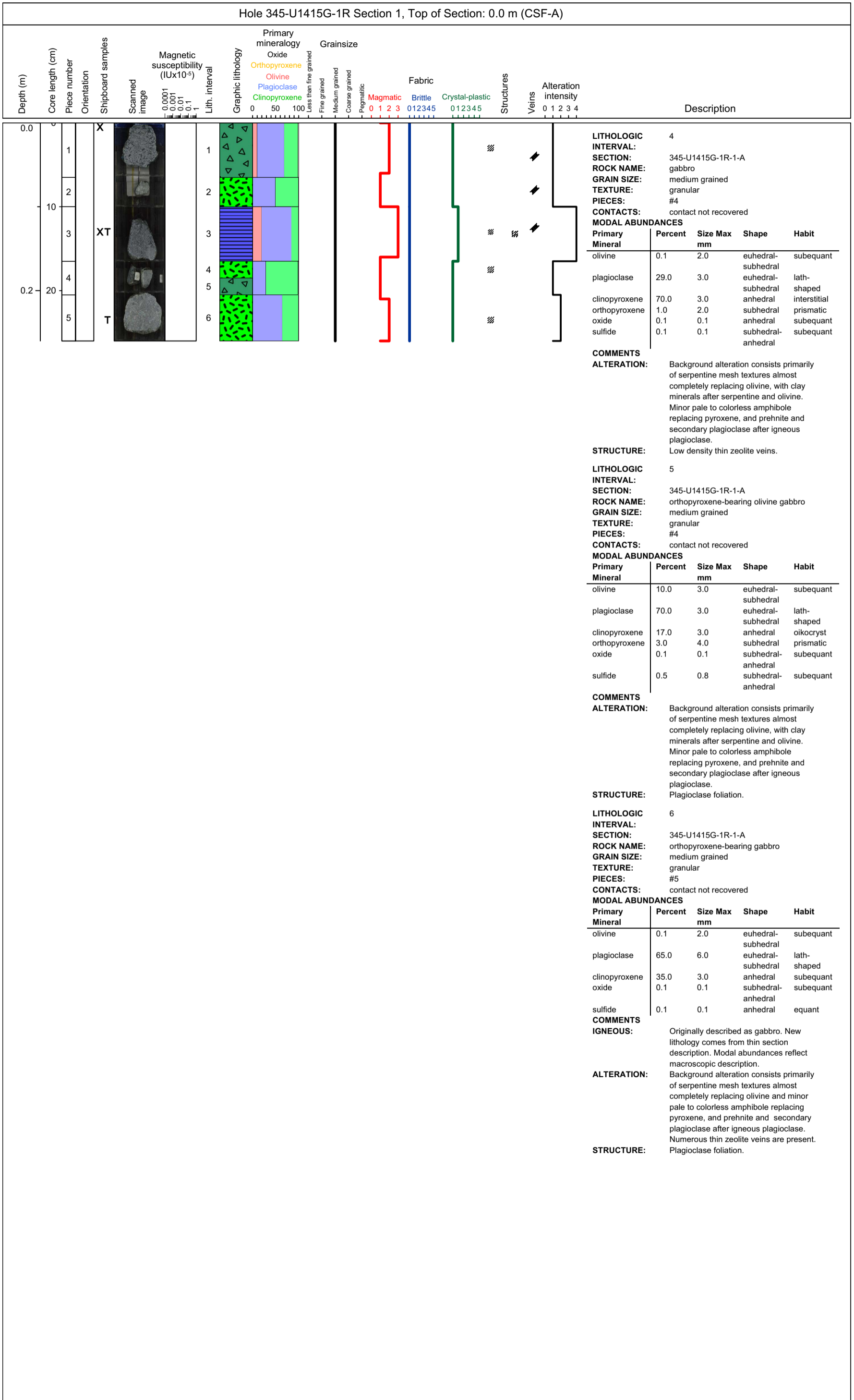


Hole 345-U1415G-1R Section 1, Top of Section: 0.0 m (CSF-A)																																																	
Depth (m)	Core length (cm)	Piece number	Orientation	Shipboard samples	Scanned image	Magnetic susceptibility (IUx10 ⁻³)	Lith. interval	Graphic lithology	Primary mineralogy	Grainsize	Fabric	Structures	Alteration intensity	Description																																			
									Oxide Orthopyroxene Olivine Plagioclase Clinopyroxene	Less than fine grained Fine grained Medium grained Coarse grained Porphyritic	Magmatic Brittle Crystal-plastic																																						
0.0	0	1	X				1							<p>LITHOLOGIC INTERVAL: 1</p> <p>SECTION: 345-U1415G-1R-1-A</p> <p>ROCK NAME: olivine gabbro</p> <p>GRAIN SIZE: medium grained</p> <p>TEXTURE: granular</p> <p>PIECES: #1</p> <p>CONTACTS: contact not recovered</p> <p>MODAL ABUNDANCES</p> <table border="1"> <thead> <tr> <th>Primary Mineral</th> <th>Percent</th> <th>Size Max mm</th> <th>Shape</th> <th>Habit</th> </tr> </thead> <tbody> <tr> <td>olivine</td> <td>10.0</td> <td>3.0</td> <td>euohedral-subhedral</td> <td>subequant</td> </tr> <tr> <td>plagioclase</td> <td>59.0</td> <td>4.0</td> <td>euohedral-subhedral</td> <td>lath-shaped</td> </tr> <tr> <td>clinopyroxene</td> <td>30.0</td> <td>4.0</td> <td>anhedral</td> <td>oikocryst</td> </tr> <tr> <td>orthopyroxene</td> <td>0.1</td> <td>5.0</td> <td>subhedral-anhedral</td> <td>prismatic</td> </tr> <tr> <td>oxide</td> <td>0.1</td> <td>0.2</td> <td>subhedral-anhedral</td> <td>subequant</td> </tr> <tr> <td>sulfide</td> <td>0.8</td> <td>1.2</td> <td>subhedral-anhedral</td> <td>subequant</td> </tr> </tbody> </table> <p>COMMENTS</p> <p>ALTERATION: Background alteration consists primarily of serpentine mesh textures almost completely replacing olivine and minor pale to colorless amphibole replacing pyroxene, and prehnite and secondary plagioclase after igneous plagioclase. Dark green clay veins, 0.5 mm in width.</p> <p>STRUCTURE: Magmatic foliation defined by plagioclase and olivine SPO. Very low density, thin alteration veins.</p>	Primary Mineral	Percent	Size Max mm	Shape	Habit	olivine	10.0	3.0	euohedral-subhedral	subequant	plagioclase	59.0	4.0	euohedral-subhedral	lath-shaped	clinopyroxene	30.0	4.0	anhedral	oikocryst	orthopyroxene	0.1	5.0	subhedral-anhedral	prismatic	oxide	0.1	0.2	subhedral-anhedral	subequant	sulfide	0.8	1.2	subhedral-anhedral	subequant
Primary Mineral	Percent	Size Max mm	Shape	Habit																																													
olivine	10.0	3.0	euohedral-subhedral	subequant																																													
plagioclase	59.0	4.0	euohedral-subhedral	lath-shaped																																													
clinopyroxene	30.0	4.0	anhedral	oikocryst																																													
orthopyroxene	0.1	5.0	subhedral-anhedral	prismatic																																													
oxide	0.1	0.2	subhedral-anhedral	subequant																																													
sulfide	0.8	1.2	subhedral-anhedral	subequant																																													
10	2	2	XT				2							<p>LITHOLOGIC INTERVAL: 2</p> <p>SECTION: 345-U1415G-1R-1-A</p> <p>ROCK NAME: gabbro</p> <p>GRAIN SIZE: medium grained</p> <p>TEXTURE: granular</p> <p>PIECES: #2</p> <p>CONTACTS: contact not recovered</p> <p>MODAL ABUNDANCES</p> <table border="1"> <thead> <tr> <th>Primary Mineral</th> <th>Percent</th> <th>Size Max mm</th> <th>Shape</th> <th>Habit</th> </tr> </thead> <tbody> <tr> <td>olivine</td> <td>0.1</td> <td>1.0</td> <td>euohedral-subhedral</td> <td>subequant</td> </tr> <tr> <td>plagioclase</td> <td>50.0</td> <td>3.0</td> <td>euohedral-subhedral</td> <td>lath-shaped</td> </tr> <tr> <td>clinopyroxene</td> <td>50.0</td> <td>4.0</td> <td>anhedral</td> <td>interstitial</td> </tr> <tr> <td>orthopyroxene</td> <td>0.1</td> <td>4.0</td> <td>subhedral-anhedral</td> <td></td> </tr> <tr> <td>oxide</td> <td>0.1</td> <td>0.8</td> <td>anhedral</td> <td>subequant</td> </tr> <tr> <td>sulfide</td> <td>0.1</td> <td>0.1</td> <td>anhedral</td> <td>subequant</td> </tr> </tbody> </table> <p>COMMENTS</p> <p>ALTERATION: Background alteration consists primarily of serpentine mesh textures almost completely replacing olivine and minor pale to colorless amphibole replacing pyroxene, and prehnite and secondary plagioclase after igneous plagioclase. Pale green prehnite and amphibole vein, 3 mm in width.</p> <p>STRUCTURE: Very low density thin amphibole veins.</p>	Primary Mineral	Percent	Size Max mm	Shape	Habit	olivine	0.1	1.0	euohedral-subhedral	subequant	plagioclase	50.0	3.0	euohedral-subhedral	lath-shaped	clinopyroxene	50.0	4.0	anhedral	interstitial	orthopyroxene	0.1	4.0	subhedral-anhedral		oxide	0.1	0.8	anhedral	subequant	sulfide	0.1	0.1	anhedral	subequant
Primary Mineral	Percent	Size Max mm	Shape	Habit																																													
olivine	0.1	1.0	euohedral-subhedral	subequant																																													
plagioclase	50.0	3.0	euohedral-subhedral	lath-shaped																																													
clinopyroxene	50.0	4.0	anhedral	interstitial																																													
orthopyroxene	0.1	4.0	subhedral-anhedral																																														
oxide	0.1	0.8	anhedral	subequant																																													
sulfide	0.1	0.1	anhedral	subequant																																													
20	4	3	T				3							<p>LITHOLOGIC INTERVAL: 3</p> <p>SECTION: 345-U1415G-1R-1-A</p> <p>ROCK NAME: clinopyroxene-oikocryst bearing troctolite</p> <p>GRAIN SIZE: medium grained</p> <p>TEXTURE: poikilitic granular</p> <p>PIECES: #3</p> <p>CONTACTS: contact not recovered</p> <p>MODAL ABUNDANCES</p> <table border="1"> <thead> <tr> <th>Primary Mineral</th> <th>Percent</th> <th>Size Max mm</th> <th>Shape</th> <th>Habit</th> </tr> </thead> <tbody> <tr> <td>olivine</td> <td>20.0</td> <td>2.0</td> <td>euohedral-subhedral</td> <td>subequant</td> </tr> <tr> <td>plagioclase</td> <td>65.0</td> <td>3.0</td> <td>euohedral-subhedral</td> <td>lath-shaped</td> </tr> <tr> <td>clinopyroxene</td> <td>15.0</td> <td>15.0</td> <td>anhedral</td> <td>oikocryst</td> </tr> <tr> <td>oxide</td> <td>0.1</td> <td>1.5</td> <td>anhedral</td> <td>subequant</td> </tr> <tr> <td>sulfide</td> <td>0.1</td> <td>0.1</td> <td>subhedral-anhedral</td> <td>subequant</td> </tr> </tbody> </table> <p>COMMENTS</p> <p>IGNEOUS: Originally described as troctolitic olivine gabbro. New lithology comes from thin section description. Modal abundances reflect macroscopic description.</p> <p>ALTERATION: Background alteration consists primarily of serpentine mesh textures almost completely replacing olivine and minor pale to colorless amphibole replacing pyroxene, and prehnite and secondary plagioclase after igneous plagioclase. Prehnite and zeolite are present within veins and halos.</p> <p>STRUCTURE: Magmatic foliation defined by plagioclase and olivine SPO. Thin zone of weakly foliated crystal plastic deformation. Low density thin zeolite veins</p>	Primary Mineral	Percent	Size Max mm	Shape	Habit	olivine	20.0	2.0	euohedral-subhedral	subequant	plagioclase	65.0	3.0	euohedral-subhedral	lath-shaped	clinopyroxene	15.0	15.0	anhedral	oikocryst	oxide	0.1	1.5	anhedral	subequant	sulfide	0.1	0.1	subhedral-anhedral	subequant					
Primary Mineral	Percent	Size Max mm	Shape	Habit																																													
olivine	20.0	2.0	euohedral-subhedral	subequant																																													
plagioclase	65.0	3.0	euohedral-subhedral	lath-shaped																																													
clinopyroxene	15.0	15.0	anhedral	oikocryst																																													
oxide	0.1	1.5	anhedral	subequant																																													
sulfide	0.1	0.1	subhedral-anhedral	subequant																																													



THIN SECTION: 345-U1415G-1R-1-W 10/16-TSB_Piece_3-TS_06
Rock name: clinopyroxene oikocryst-bearing troctolite
Rock comment: with large clinopyroxene oikocrysts (15 mm in size), moderately altered, strong magmatic foliation
Lithologic interval: 3
Piece No.: #3
Billet request comment: IgPet: Big CPX Oikocryst in one corner; Struct: Magmatic fabrics; large format

Thin Section no.: 6

Authors: JM, RW

PRIMARY MINERALOGY **No. of igneous domains:** 2 **Nature of ign. domains:** two or more lithologies

Igneous domain number: 1
Domain grain size: medium grained
Domain texture: granular
Domain comment: Strong foliation due to alignment of tabular plagioclase surrounds the oikocryst. Thin lens -or- schlieren rich in interstitial clinopyroxene grains are parallel to the foliation.

Domain lithology: troctolite
Grain size distribution: seriate
Relative abundance (%): 90



	Present (%)	Original (%)	Vol. repl. (%)	Size mode (mm)	Shape	Habit	Zoning	Color	Special features	Comment
Olivine	18	20	2	1.1	anhedral	irregular				olivine sometimes includes tabular plagioclase. Although olivine grains are very irregular in shape, alignment of their longer axes is almost parallel to the foliation of the matrix troctolite.
Plagioclase	70	76	6	1	subhedral to euhedral	tabular	continuous zoning			Strong foliation due to alignment of the tabular plagioclase. Triple junction contacts among three plagioclase grains.
Clinopyroxene	3	4	1	0.8	anhedral	irregular		colorless		sometimes contains olivine grains. Longer axes are almost parallel to the foliation.
Oxide	0.1	0.1	0	0.1	anhedral	equant				

Igneous domain number: 2
Domain grain size: coarse grained
Domain texture:
Domain comment:

Domain lithology: clinopyroxene oikocryst
Grain size distribution:
Relative abundance (%): 10

	Present (%)	Original (%)	Vol. repl. (%)	Size mode (mm)	Shape	Habit	Zoning	Color	Special features	Comment
Olivine	0	0	0	0	0	0		0		0
Plagioclase	7	7	0	0.5		elongated			chadacrysts	plagioclase chadacrysts with random orientation contained in clinopyroxene oikocryst.
Clinopyroxene	93	93	0	15		equant			oikocryst	containing elongated plagioclase chadacrysts especially in marginal part of the oikocryst

ALTERATION / METAMORPHISM **No. of alteration domains:** 1 **Domain rel. abund %:** 100 **Estimated total % alteration:** 7
Alteration domain number: 1 **Domain type:** background

SECONDARY MINERALOGY	%	REPLACING / FILLING	PRIMARY MINERAL REPLACED	% ORIGINAL	% ALTERED	REPLACEMENT MINERAL	ALTERATION COMMENTS
prehnite	3	plagioclase 3%	Olivine	15	25	serpentine 100%	
serpentine	4	olivine 3.8%, orthopyroxene 0.3%	Plagioclase	60	5	prehnite 100%	
domain total alteration %:	7		Clinopyroxene	20	0		
			Orthopyroxene	5	5	serpentine 100%	

Vein summary
 vein 1 Veins contain randomly oriented fibrous chlorite.
 vein 2 Thin prehnite vein cuts large clinopyroxene oikocryst.

ALTERATION COMMENT: Background alteration weak, but halo alteration of olivine is nearly complete. Alteration halos of olivine replaced by smectite. Magnetite occurs in olivine and is apparently after sulfide. Magnetite also forms linear aggregates in serpentine mesh after olivine. Two sulfides are present as disseminated grains in plagioclase, pyrite and chalcocopyrite?

STRUCTURE COMMENT: Magmatic: Strong magmatic foliation defined by plagioclase and rare tabular olivine SPO; ubiquitous annealed plagioclase grain boundaries. Glomero-crysts of plagioclase hosted by large clinopyroxene oikocryst. Plagioclase foliation appears to wrap at least in part, around clinopyroxene oikocryst.
 Crystal Plastic: Very minor undulose extinction in olivine.
 Brittle: Minor zones of cataclasis subparallel to magmatic foliation.
 Veins/alteration: Minor low-temperature veins cut all minerals.
 Cross-cutting Relationships (as apparent in thin section):
 1) Magmatic layering and foliation development.
 2) Minor low temperature cracking and alteration/vein formation.

PHOTOMICROGRAPHS: 345_U1415G_1R_1_TS_06.JPG
 345_U1415G_1R_1_TS_06-2.JPG

THIN SECTION: 345-U1415G-1R-1-W 21/26-TSB_Piece_5-TS_05
Rock name: gabbro
Rock comment: slightly to moderately altered, moderate magmatic foliation
Lithologic interval: 6
Piece No.: #5
Billet request comment: Gabbro; lg. Pet; primary minerals; Struct: magmatic fabrics

Thin Section no.: 5
Authors: JK, TN



PRIMARY MINERALOGY
No. of igneous domains: 1
Nature of ign. domains:
Igneous domain number: 1
Domain grain size: medium grained
Domain texture: granular
Domain comment: sign of cataclastic deformation; foliation; a few clinopyroxene show crystal plastic deformation
Domain lithology: gabbro
Grain size distribution: equigranular
Relative abundance (%): 100

	Present (%)	Original (%)	Vol. repl. (%)	Size mode (mm)	Shape	Habit	Zoning	Color	Special features	Comment
Plagioclase	55	60	5	2	subhedral	tabular	continuous zoning			some with ghost cores; some show influence of cataclasis
Clinopyroxene	30	36	6	1.5	anhedral to subhedral	prismatic		colorless	twinings; complex intergrowths	one grain with crystal-plastic deformation, some are cataclastically deformed
Orthopyroxene	0	4	4	2	anhedral to subhedral	prismatic			poikilitic	late, poikilitic crystals; some form rims about clinopyroxene; now totally altered in a "bastite" manner
Amphibole										secondary amphibole; sometimes small seams around clinopyroxene could be interpreted as late magmatic possibly together with orthopyroxene
Oxide	0.1	0.1	0	0.1	subhedral	isometric			inclusion in plagioclase	only one grain, isometric, probably primary, many are secondary

Igneous domain number:
Domain grain size:
Domain texture:
Domain comment: sign of cataclastic deformation; foliation; a few clinopyroxene show crystal-plastic deformation
Domain lithology:
Grain size distribution:
Relative abundance (%):

ALTERATION / METAMORPHISM
Alteration domain number: 1
No. of alteration domains: 1
Domain type: background
Domain rel. abund %: 100
Estimated total % alteration: 30

SECONDARY MINERALOGY	%	REPLACING / FILLING	PRIMARY MINERAL REPLACED	% ORIGINAL	% ALTERED	REPLACEMENT MINERAL	ALTERATION COMMENTS
chlorite	16.7	clinopyroxene 12%, orthopyroxene 2%, plagioclase 2.7%	Plagioclase	56	5	chlorite 95%, prehnite 5%	plagioclase altered along fractures, seam of clinopyroxene between plagioclase and orthopyroxene
clay minerals	12.8	clinopyroxene 10.8%, orthopyroxene 2%	Clinopyroxene	40	60	green amphibole 5%, chlorite 50%, clay minerals 45%	altered along cleavage surface to form clay and chlorite mixture
green amphibole	1.2	clinopyroxene 1.2%	Orthopyroxene	4	100	chlorite 50%, clay minerals 50%	clay and chlorite mixture forms pseudomorphs after orthopyroxene
prehnite	0.1	plagioclase 0.1%					
domain total alteration %:		30.8					

Vein summary
 vein 1 Thin prehnite vein.

ALTERATION COMMENT: Pervasive alteration, especially intensive in orthopyroxene and clinopyroxene. Pyrite in chlorite-filled fractures in plagioclase, along clinopyroxene cleavage surfaces, and inclusions in green amphibole.

STRUCTURE COMMENT: Magmatic: Moderate magmatic foliation defined by plagioclase SPO, with ubiquitous annealed grain boundaries. Crystal Plastic: Very minor deformation twins in plagioclase. Brittle: Minor fracturing. Veins/alteration: Very rare filled irregular cracks. Cross-cutting Relationships (as apparent in thin section): 1) Magmatic foliation development. 2) Low temperature cracking and alteration/vein formation.

PHOTOMICROGRAPHS: 345_U1415G_1R_1_TS_05.JPG
 345_U1415G_1R_1_TS_05-2.JPG