THIN SECTION LABEL ID: Observer:	391-U1576A-12R-1-W 2/2-SED DB	D-TS# 42 Thin Piec	section no.: 42 e no.:
Thin section thickness:		Unit/	/subunit: Unit II
Thin section summary:	Clasts of mineralised foraminife The grains were found on the s	era biomicrite (Fe-Mn or pyrite) a urface of the core (not in situ).	nd fresh volcanic glass.
Plane-p	olarized: 60792781	Cross-polarized: 60)793521
**	841 TS#42 101576A 1216-14 666ED		341 TS#42 U1576A 12R-1 665ED

THIN SECTION LABEL ID:	391-U1576A-25R-2-W 127/131-TSB-TS# 32	Thin section no.	: 32
Observer:	DB	Piece no.:	
Thin section thickness:		Unit/subunit:	Subunit
Thin section summary:	Bioclastic packstone with abundant shell fragments (foraminifera are less abundant than benthic foraminif angular to subrounded palagonized volcanic glass; s brown in color. Vesicles occur in some glass fragmer reworking.	inoceramid and others era. Volcaniclasts con ome of the glass is pa nts. Sub-rounded biocl). Hanktonic sists of rtly fresh and asts attest for

Plane-polarized: 60792641





391-U1576A-26R-6-W 43/45-TSB-TS# 31	Thin section no.	: 31
DB	Piece no.:	
	Unit/subunit:	Subunit
Clayey chalk or biomicrite with foraminifera and alternative the vesicle are locally elongated or crushed. Rare sample also includes burrows filled with micrite of or grain.	ered fragments of vesicu fragments of inoceramic distinct color. One accide	IIA glass. I shells. The ental biotite
	391-U1576A-26R-6-W 43/45-TSB-TS# 31 DB Clayey chalk or biomicrite with foraminifera and alt The vesicle are locally elongated or crushed. Rare sample also includes burrows filled with micrite of o grain.	391-U1576A-26R-6-W 43/45-TSB-TS# 31 Thin section no. DB Piece no.: Unit/subunit: Unit/subunit: Clayey chalk or biomicrite with foraminifera and altered fragments of vesicu The vesicle are locally elongated or crushed. Rare fragments of inoceramic sample also includes burrows filled with micrite of distinct color. One accide grain.

Plane-polarized: 60835261





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38R-2 65-68

THIN SECTION LABEL ID:	391-U1576A-38R-2-W 65	5/68-TSB-TS# 33 Thin section no.: 33
Observer:	DB	Piece no.:
Thin section thickness:		Unit/subunit: Unit IV
Thin section summary:	Bioclastic sandstone with planktonic foraminifera, a fragments. The foraminife	fragments of inoceramid shells, benthic foraminifera, nd rare volcanic glass altered to zeolite. Rare chalcedony era are typically filled by clay. The cement is zeolite.
Plane-r	oolarized: 60792601	Cross-polarized: 60792621
120	191 TS#33	ant Texas

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THIN SECTION LABEL ID:	391-U1576A-40R-4-W 117/120-TSB-TS# 34	Thin section no.: 34
Observer:	WN	Piece no.:
Thin section thickness:		Unit/subunit:
Thin section summary:	Glomeroporphyritic aphanitic with large plagioclase Plagioclase shows a seriate texture, making it difficu and groundmass crystals. Oscillatory zoning and mi present. Clinopyroxene is present as phenocrysts by present but has been completely altered to serpentin and confined to the mesostasis. Mesostasis shows p	glomerocrysts and phenocrysts. It to distinguish between phenocryst nor internal resorption is also ut are noticeably smaller. Olivine is nite. Fe-Ti oxides are mostly skeletal patchy alteration.

Plane-polarized: 60792681

Cross-polarized: 60792701



Igneous Petrology

Lithology:

moderately

bimodal

Grain size distribution:

Major texture:

glomeroporphyritic



Groundmass grain size (avg.):

fine-grained

Minor Texture:

aphanitic

Phenocrysts	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments	
Olivine	3		3	0.1	0.4	subhedral	subhedral	Completely replaced by serpentine	
Plagioclase	20	17	3	0.1	2.4	subhedral	tabular	Contains both phenocrysts and glomerocrysts of plagioclase. Mostly a seriate texture, making it diffult to distinguish between small phenocrysts and large grounmass crystals. Blocky crystals show mild seive textures.	
Clinopyroxene	9	8	1	0.1	0.4	subhedral	equant	No large phenocrysts - most are close to the same size. Subophitic textures.	
Groundmass	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments	
Plagioclase	20	20		0.05	0.15	subhedral	elongate	Seriate texture - difficult so separate phenocryst from groundmass	
Clinopyroxene	12	11	1	0.04	0.1	anhedral	equant		
Fe-Ti oxide	3		3			anhedral	elongate	N/A	
Mesostasis	33	25	8	N/A	N/A	N/A	N/A	Contains microlites of oxides and plag. Alteration causes significant discoloration	
Vesicle	Original (%)	Empty (%)	Filled (%)	Size min. (mm)	Size max. (mm)	Shape	Comments		
Vesicle	2		2	0.8	1	rounded	Completely filled	with radiating secondary mineral	

THIN SECTION	ON LABEL ID: 391-U1576A-41R-2-W 16/19						-TSB-TS# 35 Thin section no.: 35			
Observer:	Observer: MT						Piece no.:			
Thin section	on thick	ness:						Uni	t/subunit:	
Thin section summary: Sparsely plagioclase-augite in both phenocrysts and grou the groundmass. There is als							yric basalt with dmass. Altered g an occurrence o	an aphanitic tex glass and meso of disseminated	ture. Plagioclase occurs stasis regions are part of Fe-Ti-Oxides.	
	F	Plane-po	olarizec	l: 607	92721		Cro	ss-polarized: 6	0792741	
Frane-polarized. 00792721							art Tsas urstrea tra-g			
		~~~								
gneous Pe	etrolog	<b>yy</b> sr	oarselv				plagioclase-aug	ite phyric basalt		
gneous Pe Lithology:	trolo	<b>уу</b> sp	oarsely				plagioclase-aug massive lava flo	ite phyric basalt w		
<b>gneous Pe</b> Lithology: Grain size distr	e <b>trolo</b> g	<b>уу</b> sp bi	barsely modal				plagioclase-aug massive lava flo Groundmass gra	ite phyric basalt w iin size (avg.):	microcrystalline	
gneous Pe Lithology: Grain size distr Major texture:	ibution:	<b>gy</b> sp bi gl	oarsely modal omerop	porphyl	itic		plagioclase-aug massive lava flo Groundmass gra Minor Texture:	ite phyric basalt w nin size (avg.):	microcrystalline aphanitic	
gneous Pe Lithology: Grain size distr Major texture: Phenocrysts	ibution:	gl Present (%)	modal omerop Replaced (%)	Size min. (mm)	ritic Size max. (mm)	Shape	plagioclase-aug massive lava flo Groundmass gra Minor Texture:	ite phyric basalt w nin size (avg.):	microcrystalline aphanitic	
gneous Pe Lithology: Grain size distr Major texture: Phenocrysts	ibution:	gy bi gl Present (%) 5	oarsely modal omerop Replaced	Size min. (mm) 0.1	ritic Size max. (mm) 0.8	Shape subhedral	plagioclase-aug massive lava flor Groundmass gra Minor Texture: Habit elongate	ite phyric basalt w hin size (avg.): Comments Plagioclase may occ with augite in some	microcrystalline aphanitic ur as glomerocrysts associated instances	
gneous Pe Lithology: Grain size distr Major texture: Phenocrysts Plagioclase	ibution: Original (%) 5 3	<b>y y</b> sp bi gl Present (%) 5 2	oarsely modal omerop Replaced (%)	Size min. (mm) 0.1	ritic Size max. (mm) 0.8 0.2	Shape subhedral anhedral	plagioclase-aug massive lava flor Groundmass gra Minor Texture: Habit elongate subequant	ite phyric basalt W nin size (avg.): Comments Plagioclase may occ with augite in some	microcrystalline aphanitic tur as glomerocrysts associated instances	
gneous Pe Lithology: Grain size distr Major texture: Phenocrysts Plagioclase Clinopyroxene Dxide Fe-Ti	ibution: Original (%) 5 3 10	<b>y y</b> sp bi gl Present (%) 5 2 10	modal omerop Replaced 1 0	Size min. (mm) 0.1 0.08 0.04	ritic Size max. (mm) 0.8 0.2 0.4	Shape subhedral anhedral	plagioclase-aug massive lava flor Groundmass gra Minor Texture: Habit elongate subequant	ite phyric basalt w hin size (avg.): Comments Plagioclase may occ with augite in some They are randomly sample	microcrystalline aphanitic tur as glomerocrysts associated instances	
gneous Pe Lithology: Grain size distr Major texture: Phenocrysts Plagioclase Clinopyroxene Oxide Fe-Ti Groundmass	etrolog ibution: Original (%) 5 3 10 Original (%)	yy sp bi gl Present (%) 5 2 10 Present (%)	modal omerop Replaced 1 0 Replaced (%)	Size min. (mm) 0.1 0.08 0.04 Size min. (mm)	ritic Size max. (mm) 0.8 0.2 0.4 Size max. (mm)	Shape subhedral anhedral Shape	plagioclase-aug massive lava flor Groundmass gra Minor Texture: Habit elongate subequant Habit	ite phyric basalt in size (avg.): Comments Plagioclase may occ with augite in some They are randomly sample Comments	microcrystalline aphanitic tur as glomerocrysts associated instances	
gneous Pe Lithology: Grain size distr Major texture: Phenocrysts Plagioclase Clinopyroxene Dxide Fe-Ti Groundmass	etrolog ibution: Original (%) 5 3 10 Original (%) 5	<b>yy</b> sp bi gl Present (%) 5 2 10 Present (%) 5	modal omerop Replaced (%) 1 0 Replaced (%)	Size min. (mm) 0.1 0.08 0.04 Size min. (mm) 0.02	ritic Size max. (mm) 0.8 0.2 0.4 Size max. (mm) 0.1	Shape subhedral anhedral Shape subhedral	plagioclase-aug massive lava flor Groundmass gra Minor Texture: elongate subequant Habit Habit	ite phyric basalt w nin size (avg.): Comments Plagioclase may occ with augite in some They are randomly sample Comments	microcrystalline aphanitic tur as glomerocrysts associated instances	
gneous Pe Lithology: Grain size distr Major texture: Phenocrysts Plagioclase Clinopyroxene Oxide Fe-Ti Groundmass Plagioclase Fe-Ti oxide	etrolog ibution: Original (%) 5 3 10 Original (%) 5 3	<b>y y</b> sp bi gl Present (%) 5 2 10 Present (%) 5 10	modal omerop Replaced 1 0 Replaced (%)	Size min. (mm) 0.1 0.08 0.04 Size min. (mm) 0.02	ritic Size max. (mm) 0.8 0.2 0.4 Size max. (mm) 0.1	Shape subhedral anhedral Shape subhedral anhedral	plagioclase-aug massive lava flor Groundmass gra Minor Texture: elongate subequant Habit Habit elongate elongate	ite phyric basalt in size (avg.): Comments Plagioclase may occ with augite in some They are randomly sample Comments N/A	microcrystalline aphanitic tur as glomerocrysts associated instances priented throughout the	
gneous Pe Lithology: Grain size distr Major texture: Phenocrysts Plagioclase Clinopyroxene Oxide Fe-Ti Groundmass Plagioclase Fe-Ti oxide Mesostasis	etrolog ibution: Original (%) 5 3 10 Original (%) 5 3 3 38	<b>yy</b> sp bi gl Present (%) 5 2 10 Present (%) 5 10	arsely modal omerop Replaced (%) 1 0 Replaced (%) 38	Size min. (mm) 0.1 0.08 0.04 Size min. (mm) 0.02 N/A	ritic Size max. (mm) 0.8 0.2 0.4 Size max. (mm) 0.1	Shape subhedral anhedral Shape subhedral anhedral N/A	plagioclase-aug massive lava flor Groundmass gra Minor Texture: elongate subequant Habit Habit elongate equant	ite phyric basalt w nin size (avg.): Comments Plagioclase may occ with augite in some They are randomly sample Comments N/A	microcrystalline aphanitic tur as glomerocrysts associated instances oriented throughout the	

Observer: DB Piece no.:   Thin section thickness: Unit/subunit: Unit /V   Thin section summary: Bioclastic sandstone with planktonic foraminifera, fragments of inoceramid shells, benthic foraminifera, and rare volcanic glass altered to zeolite. The foraminifera are typically filled by clay. Rare lithic fragments of biomicrite. The cement is zeolite. Base of a turbidite.	THIN SECTION LABEL ID:	391-U1576B-2R-1-W 17/19-TSB-TS# 37	Thin section no.:	37
Thin section thickness: Unit/subunit: Unit IV   Thin section summary: Bioclastic sandstone with planktonic foraminifera, fragments of inoceramid shells, benthic foraminifera, and rare volcanic glass altered to zeolite. The foraminifera are typically filled by clay. Rare lithic fragments of biomicrite. The cement is zeolite. Base of a turbidite.	Observer:	DB	Piece no.:	
Thin section summary: Bioclastic sandstone with planktonic foraminifera, fragments of inoceramid shells, benthic foraminifera, and rare volcanic glass altered to zeolite. The foraminifera are typically filled by clay. Rare lithic fragments of biomicrite. The cement is zeolite. Base of a turbidite.	Thin section thickness:		Unit/subunit:	Unit IV
	Thin section summary:	Bioclastic sandstone with planktonic foraminifera, fragn benthic foraminifera, and rare volcanic glass altered to typically filled by clay. Rare lithic fragments of biomicrite a turbidite.	tents of inoceramid s zeolite. The foraminif a. The cement is zeol	hells, era are lite. Base of

Plane-polarized: 60835301





THIN SECTION LABEL ID: Observer:	<b>391-U1576B-4R-1-W 95/97-</b> DB	TSB-TS# 36	Thin section no.: Piece no.:	36
Thin section thickness:	Riomicrito with abundant bro	kan nlanktania faraminifara an	Unit/subunit:	Unit IV
		iken planktonic toraminiera and		
Plane-p	olarized: 60911161	Cross-polarized	60911181	
	341 TS#36 4A-1 U15768 95-97		341 T8#36 48-1 U15768 46-47	

391-U1576B-4R-1-W 95/97-TSB-TS# 36 Page 1 of 0

THIN SECTION LABEL ID:	391-U1576B-4R-1-W 101/103-TSB-TS# 40	Thin section no.:	40
Observer:	DB	Piece no.:	
Thin section thickness:		Unit/subunit:	Unit IV
Thin section summary:	Bioclastic sandstone/packstone with abundant fragments inoceramid) and foraminifera, and rare echinoderm fragment no to highly vesicular. The matrix is composed of micrite. includes minor dolomite and fragments of biomicrite.	of shells (predomir ents. Minor altered The sediment addi	antly glass, from tionally

Plane-polarized: 60835341





THIN SECTION LABEL ID:	391-U1576B-6R-1-W 113/116-TSB	TS# 41 Thin section no.: 41
Observer:	JLS	Piece no.:
Thin section thickness:		Unit/subunit:
Thin section summary:	Moderately plagioclase-augite phyriclinopyroxene. Plagioclase zoning is present. Plagioclase labradorescente Groundmass is microcrystalline and Fe-oxides. Pyrite is present in the all	c basalt with microlites of plagioclase and scarce but exhibits oscillatory patterns when ce is present indicating An content of 50-70. consists of clinopyroxene, plagioclase, and skeletal tered groundmass, veins, and vesicles.
Plane-p	oolarized: 60835561	Cross-polarized: 60835581



# Igneous Petrology

Lithology:	moderately						plagioclase-augite phyric basalt lava flow		
Grain size distri	ibution	: in	equigra	anular			Groundmass gra	ain size (avg.):	cryptocrystalline
Major texture:		ap	ohanitic	:		l	Minor Texture:		vitrophyric
Phenocrysts	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments	
Plagioclase	6	5	1	0.05	0.2	subhedral	tabular	Plagioclase exhibit: light.	s labradorescence in reflected
Clinopyroxene	3	2	1	0.05	0.15	subhedral	subequant		
Groundmass	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments	
Mesostasis	50	30	20	N/A	N/A	N/A	N/A	Looks like small CP oxides.	X , Plagioclase, and skeletal Fe-
Glass	39	3	36	N/A	N/A	N/A	N/A		
Vesicle	Original (%)	Empty (%)	Filled (%)	Size min. (mm)	Size max. (mm)	Shape	Comments		
Vesicle	1	0	1	0.2	2	rounded	Filled by pyrite, c	alcite, and zeolites.	

THIN SECTION LABEL ID:	391-
Observer:	MT
Thin section thickness:	
Thin section summary:	Mod

#### -U1576B-6R-3-W 96/99-TSB-TS# 39

Thin section no.: 39

Piece no.:

Unit/subunit:

Moderately plagioclase-augite phyirc basalt with an aphanitic texture. Some plagioclase grains show alteration to sericite whereas some augites show alteration along the rims or within the mineral.

Plane-polarized: 60808311 Cross-polarized: 60808331 01576E 6R-3 96-99

laneous	Petrology
ignoodo	

moderately

Grain size distribution:

Lithology:

bimodal

Major texture:

aphanitic

pla pil	agioclase-augi Ilow lava flow	te phyric basalt	
Gr	oundmass gra	in size (avg.):	glass
Mi	nor Texture:		glomeroporphyritic

Phenocrysts	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments
Plagioclase	8	7	1	0.04	0.5	subhedral	tabular	Some plagioclase grains altred to sercite
Clinopyroxene	4	3	1	0.04	0.3	anhedral	subequant	alteration occurs within or on mineral rims
		1				I		
Groundmass	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments
Glass	88	44	44	N/A	N/A	N/A	N/A	Not complete fresh glass
							1	
Vesicle	Original (%)	Empty (%)	Filled (%)	Size min. (mm)	Size max. (mm)	Shape	Comments	
Vesicle	0.5	0	0.5	0.1	0.1	rounded	vesicle consist of zeolite	

THIN SECTION LABEL ID:	391-U1576B-7R-1-W 125/128-7	<b>TSB-TS# 38</b> Thin section no.: 38
Observer:	JLS	Piece no.:
Thin section thickness:		Unit/subunit:
Thin section summary:	Highly aphyric basalt pillow lava plagioclase and clinopyroxene i crystals appears to be altered b unknown composition.	a. The pillow lava contains small glomerocyrsts of n the groundmass. Glass between the groundmass ut is actually full of cryptocrystalline crystal needles of
Plane-p	Cross-polarized: 60917991	



## **Igneous Petrology**

Lithology: Grain size distribution: bimodal

Major texture:

aphyric basalt	pillow lava flow	

cryptocrystalline

aphanitic	
apriaritie	

Groundmass grain size (avg.):	
Minor Texture:	

holohyaline

Groundmass	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments	
Plagioclase	8	7	1	0.07	0.3	euhedral	tabular	Plagioclase groundmass often exhibits oscillatory zoning.	
Clinopyroxene	6	3	3	0.01	0.2	subhedral	equant		
Mesostasis	60	50	10	N/A	N/A	N/A	N/A	Looks like altered glass until you use 40x objective and can see the small crystal needles.	
Glass	26	10	16	N/A	N/A	N/A	N/A		
Vesicle	Original (%)	Empty (%)	Filled (%)	Size min. (mm)	Size max. (mm)	Shape	Comments		
Vesicle	1	0	1	0.05	0.1	rounded	Filled with calcite and clay.		

THIN SECTION LABEL ID:**391-U1576B-9R-3-W 82/85-TSB-TS# 45**Thin section no.: 45Observer:JWS, JLSPiece no.:Thin section thickness:Unit/subunit:Thin section summary:Moderately aphyric basalt lava flow. The contains small glomerocyrsts of plagioclase<br/>and highly altered clinopyroxene in the groundmass. Glass between the groundmass<br/>crystals is completely altered. Calcite, pyrite, zeolites, and fill the vesicles in the<br/>sample.

Plane-polarized: 60835421



Igneous P	etrolo	gу							
Lithology: moderately						aphyric basalt lava flow			
Grain size dist	ribution	: bi	imodal			Groundmass grain size (avg.): cryptocrys			
Major texture	:	a	ohanitio	2	Minor Texture:		2:	porphyritic	
Groundmass	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments	
Plagioclase	35	30	5	0.05	0.3	euhedral	tabular		
Clinopyroxene	21	1	20	0.01	0.3	subhedral	subequant		
Fe-Ti oxide	7			0.01	0.08	anhedral	skeletal	N/A	
Glass	37	0	37	N/A	N/A	N/A	N/A	Glass is completel	y altered.
Vesicle	Original (%)	Empty (%)	Filled (%)	Size min. (mm)	Size max. (mm)	Shape	Comments		
Vesicle	3	0	3	0.2	4.2	rounded Filled by calcite, pyrite, zeolites, and clays.			

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THIN SECTION LABEL ID: Observer: Thin section thickness:	<b>391-U1576B-11R-2-W 86/8</b> JWS	9-TSB-TS# 43	Thin section no.: 43 Piece no.: Unit/subunit:
Thin section summary:	Euhedral plag laths set in m mm across. Secondary calc found in glomerpcrysts with gloms, subophitic cpx=calci grains, typically hollow with	atrix of quenched/devitrified gla ite in some gloms. Some isolate plagioclase. Suhedral Cpx som te still enclosed ends of plag lath herringbone texture.	ss. Plag-Px gloms up to 2.4 ed phenocrysts but most etimes replaced by calcite. Ir hs. Large skeletal magnetite
Plane-p	oolarized: 60835381	Cross-polarized:	60835401
	391 TS#43 U1576B 118-2 86-99		341 TS#43 U1576B 11R-2 86-89

### **Igneous Petrology**

Lithology:

Grain size distribution:

Major texture:

bimodal porphyritic

highly

#### plagioclase-augite phyric basalt pillow lava flow

cryptocrystalline

Groundmass grain size (avg.):

Minor Texture:

Phenocrysts	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments	
Olivine	0	0	0						
Plagioclase	30	30	0	0.2	1	euhedral	tabular	Euhedral plag laths set in matrix of quenched/devitrified glass. Plag-Px gloms up to 2.4 mm across. Secondary calcite in some gloms	
Clinopyroxene	25	22	3	0.14	0.6	subhedral	equant	Some isolated phenocrysts but most found in glomerpcrysts with plagioclase. Suhedral Cpx sometimes replaced by calcite. In gloms, subophitic cpx=calcite still enclosed ends of plag laths.	
Oxide Fe-Ti	2	2	0	0.1	0.35	subhedral	subhedral	Large skeletal magnetite grains, typically hollow with herringbone texture.	
Groundmass	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments	
Olivine	0	0	0						
Plagioclase	0	0	0						
Clinopyroxene	0	0	0						
Fe-Ti oxide		2	0					N/A	
Mesostasis	43	40	3	N/A	N/A	N/A	N/A	Mesostasis consists of microcrystalline plag laths in clusters and plumes within microcrystalline or cryptocrystalline pyroxene, along with tiny opaques. Mesostasis appears to be quenched melt but may be devitrified glass.	
Vesicle	Original (%)	Empty (%)	Filled (%)	Size min. (mm)	Size max. (mm)	Shape	Comments		
Vesicle	5	4	1	0.12	2.4	angular	Typically lined with isotropic	Typically lined with calcite. Some rounded vesicles have calcite lining with isotropic mineral (clear UPL) and pyrite.	

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THIN SECTION LABEL ID:	391-U1576B-12R-3-W 89/9	1-TSB-TS# 44	Thin section no	.: 44
Observer:	DB		Piece no.:	
Thin section thickness:			Unit/subunit:	Unit V (S3)
Thin section summary:	Bioclastic sandstone (wacke subordinate fragments of sh altered volcanic glass. The chambers are often filled by	estone to packstone) with ab nells (mostly inoceramid). Ra matrix is composed of micrit r clay. Rare dolomite also oc	oundant foraminifer are fragments of ec e and clay; foramir curs.	a and hinoderm and ifera
Plane-p	olarized: 60863761	Cross-polari	zed: 60863781	
	341 T844 U1576B 112-3 8-91		391 T5#44 U15768 12R-3 89-91	

THIN SECTION LABE Observer: Thin section thick Thin section sum	EL ID: <b>391-U15</b> DB mess: mary: Biomicri	<b>576B-13R-1-W</b> 1	12/16-TSB-TS# 50 T P U Janktonic foraminifera and abundant	hin section no.: iece no.: nit/subunit: dolomite.	50 Unit V (S3)
	Plane-polarized:	60863961	Cross-polarized:	60863981	
		341 TS#58 U15768 13R-1 12-16		341 TS#58 U15768 138-1 12-16	

THIN SECTION LABEL ID:	391-U1576B-13R-1-W 51/	54-TSB-TS# 49	Thin section no	.: 49				
Observer:	DB		Piece no.:					
Thin section thickness:			Unit/subunit:	Unit V (S3)				
Thin section summary:	Bioclastic sandstone / pacl and subordinate planktonic fragments are concentrate	Bioclastic sandstone / packstone with abundant fragments of shells (mostly inoceramid and subordinate planktonic foraminifera. Minor spicules of calcareous sponge. Shell fragments are concentrated at the base of the graded sandstone bed.						
Plane-p	polarized: 60863921	Cross-pc	larized: 60863941					
		and the second se						





THIN SECTION LABEL ID:	391-U1576B-13R-3-W 74/78-T	SB-TS# 51 Thin section no.: 51
Observer:	JLS	Piece no.:
Thin section thickness:		Unit/subunit:
Thin section summary:	Moderately plagioclase-augite Clinopyroxene phenocrysts and oxides exhibit anhedral growth vesicles. Vesicles primarily fille	bhyric basalt that has been moderately altered. I groundmass have almost been completely altered. Fe- Pyrite visible in altered regions and observed in d with calcite and clay.
Plane-c	olarized: 60913111	Cross-polarized: 60913131



# Igneous Petrology

Lithology:		m	oderate	ely			plagioclase-augite phyric basalt lava flow			
Grain size distri	ibution	se	eriate				Groundmass gra	ain size (avg.):	fine-grained	
Major texture:		gl	omerop	oorphy	ritic		Minor Texture:		ophitic	
Phenocrysts	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments		
Plagioclase	6	5	1	0.5	1.5	euhedral	tabular	Euhedral plagiocla	ase laths	
Clinopyroxene	4	3	1	0.3	0.8	subhedral	subequant	Clinopyroxene nu	cleates off of plagioclase.	
Groundmass	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments		
Plagioclase	17	17	0	0.1	0.4	euhedral	tabular			
Clinopyroxene	15	5	10	0.05	0.2	subhedral	equant			
Fe-Ti oxide	7			0.005	0.05	anhedral	elongate	N/A		
Mesostasis	40	30	10	N/A	N/A	N/A	N/A			
Glass	10.9	1	9.9	N/A	N/A	N/A	N/A	Mostly altered pal	agonite.	
Vesicle	Original (%)	Empty (%)	Filled (%)	Size min. (mm)	Size max. (mm)	Shape	Comments			
Vesicle	3	0	3	1	7	subangular	Typically filled wi	ith calcite and clay.		

THIN SECTION	N LABE	LID:	391-U	1576B	-14R-2	2-W 0/3-TS	B-TS# 46	Th	In section no.: 46
Observer:			JLS					Pie	ece no.:
Thin section	on thick	ness:						Un	it/subunit:
Thin section	on sumi	mary:	Highly ground pheno	plagio dmass cryst c	clase-a phase rystals	augite-phyr - most crys . Fe-Ti oxic	ic basalt with su stals are phenoc des are large end	bophitic and int rysts. Altered g bugh to be cons	ersertal textures. No clea lass is present between sidered phenocrysts.
	I	Plane-po	olarizec	l: 608	63801		Cro	ss-polarized: (	60863821
THE W				14R-2 8-3	391 TS#46 U15768		At the I		391 TS#46 915758 145758 145758 8-3
Igneous Pe	etrolo	gy _{bi}	ably				plagioclase-aug	ite phyric basalt	
Igneous Pe	etrolo	<b>gy</b> hi	ghly				plagioclase-aug lava flow	ite phyric basalt	
<b>Igneous Pe</b> Lithology: Grain size distr	e <b>trolo</b>	<b>gy</b> hi	ghly riate				plagioclase-aug lava flow Groundmass gra	ite phyric basalt ain size (avg.):	fine-grained
<b>Igneous Pe</b> Lithology: Grain size distr Major texture:	e <b>trolo</b> ; ribution:	<b>gy</b> hi se	ghly riate terserta	al			plagioclase-aug lava flow Groundmass gra Minor Texture:	ite phyric basalt ain size (avg.):	fine-grained ophitic
Igneous Pe Lithology: Grain size distr Major texture: Phenocrysts	ribution:	gy hi se in Present (%)	ghly riate terserta Replaced (%)	al Size min. (mm)	Size max. (mm)	Shape	plagioclase-aug lava flow Groundmass gra Minor Texture: Habit	<b>ite phyric basalt</b> ain size (avg.): Comments	fine-grained ophitic
Igneous Pe Lithology: Grain size distr Major texture: Phenocrysts Plagioclase	ribution:	gy hi se in Present (%) 25	ghly riate terserta ^{Replaced}	al Size min. (mm) 0.4	Size max. (mm) 2	Shape subhedral	plagioclase-aug lava flow Groundmass gra Minor Texture: Habit tabular	ite phyric basalt ain size (avg.):	fine-grained ophitic
Igneous Pe Lithology: Grain size distr Major texture: Phenocrysts Plagioclase Clinopyroxene	ribution: Original (%) 26 35	<b>gy</b> hi se in Present (%) 25 30	ghly riate terserta Replaced 1 5	Size min. (mm) 0.4 0.4	Size max. (mm) 2 1	Shape subhedral subhedral	plagioclase-aug lava flow Groundmass gra Minor Texture: Habit tabular equant	ite phyric basalt ain size (avg.): Comments	fine-grained ophitic s are common
Igneous Pe Lithology: Grain size distr Major texture: Phenocrysts Plagioclase Clinopyroxene Oxide Fe-Ti	original (%) 26 35 5	<b>gy</b> hi se in Present (%) 25 30 5	ghly riate terserta ^{Replaced} 1 5 0	al Size min. (mm) 0.4 0.4 0.1	Size max. (mm) 2 1 0.3	Shape subhedral subhedral subhedral	plagioclase-aug lava flow Groundmass gra Minor Texture: Habit tabular equant subhedral	ite phyric basalt ain size (avg.): Comments subophitic texture: Large skeletal oxid phenocrysts.	fine-grained ophitic s are common es form between silicate
Igneous Pe Lithology: Grain size distr Major texture: Phenocrysts Plagioclase Clinopyroxene Oxide Fe-Ti Groundmass	etrolog ribution: Original (%) 26 35 5 Original (%)	<b>gy</b> hi se in Present (%) 25 30 5 Present (%)	ghly riate terserta Replaced 1 5 0 Replaced (%)	al Size min. (mm) 0.4 0.4 0.1 Size min. (mm)	Size max. (mm) 2 1 0.3 Size max. (mm)	Shape subhedral subhedral subhedral Shape	plagioclase-aug   lava flow   Groundmass gra   Minor Texture:   Habit   tabular   equant   subhedral	ite phyric basalt ain size (avg.): Comments subophitic texture: Large skeletal oxid phenocrysts.	fine-grained ophitic s are common es form between silicate
Igneous Pe Lithology: Grain size distr Major texture: Phenocrysts Plagioclase Clinopyroxene Oxide Fe-Ti Groundmass Plagioclase	ribution: Original (%) 26 35 5 Original (%) Original 6	<b>gy</b> hi se in Present (%) 25 30 5 Present (%) 5	ghly rriate terserta Replaced (%) 1 5 0 Replaced (%) 1	Size min. (mm) 0.4 0.4 0.1 Size min. (mm) 0.05	Size max. (mm) 2 1 0.3 Size max. (mm) 0.4	Shape subhedral subhedral subhedral Shape subhedral	plagioclase-aug   lava flow   Groundmass gra   Minor Texture:   Habit   tabular   equant   subhedral   Habit	ite phyric basalt ain size (avg.): Comments subophitic texture: Large skeletal oxid phenocrysts.	fine-grained ophitic s are common les form between silicate
Igneous Pe Lithology: Grain size distr Major texture: Phenocrysts Plagioclase Clinopyroxene Oxide Fe-Ti Groundmass Plagioclase Clinopyroxene	etrolog	<b>gy</b> hi se in Present (%) 25 30 5 Present (%) 5 5	ghly riate terserta Replaced 1 5 0 Replaced (%) 1 3	al Size min. (mm) 0.4 0.4 0.1 Size min. (mm) 0.05 0.03	Size max. (mm) 2 1 0.3 Size max. (mm) 0.4 0.4	Shape subhedral subhedral subhedral Shape subhedral subhedral	plagioclase-aug   ava flow   Groundmass gra   Minor Texture:   Habit   tabular   equant   subhedral   Habit   elongate   equant	ite phyric basalt ain size (avg.): Comments subophitic texture: Large skeletal oxid phenocrysts.	fine-grained ophitic s are common es form between silicate
Igneous Pe Lithology: Grain size distr Major texture: Phenocrysts Plagioclase Clinopyroxene Oxide Fe-Ti Groundmass Plagioclase Clinopyroxene Fe-Ti oxide	etrolog ribution: Original (%) 26 35 5 5 Original (%) 6 8	<b>gy</b> hi se in Present (%) 25 30 5 Present (%) 5 5 5 5	ghly rriate terserta Replaced (%) 1 5 0 Replaced (%) 1 3	Size min. (mm) 0.4 0.4 0.1 Size min. (mm) 0.05 0.03	Size max. (mm) 2 1 0.3 Size max. (mm) 0.4 0.4	Shape subhedral subhedral subhedral Shape subhedral subhedral	plagioclase-aug   Groundmass gra   Minor Texture:   Habit   tabular   equant   subhedral   Habit   elongate   equant	ite phyric basalt ain size (avg.): Comments subophitic texture: Large skeletal oxid phenocrysts. Comments	fine-grained ophitic s are common es form between silicate

THIN SECTION LABEL ID:	391-U1576B-15R-3-W	68/71-TSB-TS# 48	hin section no.:	48
Observer:	DB	P	Piece no.:	
Thin section thickness:		U	Jnit/subunit:	Unit V (S6)
Thin section summary:	Micrite with dolomite. Noverprint.	No fossil seen, probably nannofossil o	oze with diagene	etic
Plane-p	olarized: 60863881	Cross-polarized:	60863901	
	341 T5448 U15788 1157-3 68-71		341 T5#48 115768 156-3 66-71	

THIN SECTION LABEL ID: Observer: JLS, WN Thin section thickness: Thin section summary:

#### 391-U1576B-17R-2-W 2/6-TSB-TS# 47

Thin section no.: 47

Piece no.:

Unit/subunit:

Highly glomerophorphyritic/porphyritic with aphanitic mesostasis laden with skeletal plagioclase and Fe-Ti oxides. Plagioclase >> Clinopyroxene = olivine. Plagioclase and clinopyroxene show oscillatory zoning (mostly bimodal) with mild resorption in the cores. Olivine is partially replaces with a serpentine/saponite mineral.

Plane-polarized: 60863841



## **Igneous Petrology**

Lithology:

moderately

Grain size distribution:

bimodal

Major texture: porphyritic plagioclase-augite-olivine phyric basalt lava flow

Groundmass grain size (avg.):

Minor Texture:

dendritic or skeletal

microcrystalline

Phenocrysts	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments
Olivine	5	2	3	0.2	1	subhedral	subhedral	Many grains with olivine shape, pale green color completely replaced by low birefringence phase (serpentine?) plus carbonate. Similar grains in groundmass. Unaltered grains might be Cpx. Intergrown with plag in one place, single phenocryst in others.
Plagioclase	3	3	0	0.4	2.4	euhedral	tabular	Euhedral plag laths, commonly in plag-only or plag-dominant glomercrysts up to 5 mm across. No zoning or minor oscillatory zoning in cores, with major step to outermost rim seen in almost all big plag phenocrysts. Similar step seen in Cpx.
Clinopyroxene	2	2	0	0.2	0.4	subhedral	elongate	Some isolated phenocrysts but most found in glomerpcrysts with plagioclase. Suhedral Cpx sometimes replaced by calcite. In gloms, subophitic cpx=calcite still enclosed ends of plag laths.
Groundmass	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments
Plagioclase	18	15	3	0.1	0.3	euhedral	elongate	Long, slender plag grains randomly oriented throughout the groundmass. Most display skeletal growth with visible hollow interiors (recorded as "swallow tails" or hollow rectangles)
Clinopyroxene	7	7	0	0.05	0.17	subhedral	equant	
Fe-Ti oxide	5		3	0.02	0.2	subhedral	elongate	N/A
Mesostasis	50	40	10	N/A	N/A	N/A	N/A	Was once melt but rapid growth during eruption prevented true glass formation. Mostly "fresh" but contains patches of alteration.
Glass	0	0		N/A	N/A	N/A	N/A	

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Vesicle	Original (%)	Empty (%)	Filled (%)	Size min. (mm)	Size max. (mm)	Shape	Comments
Vesicle	0	0	0				