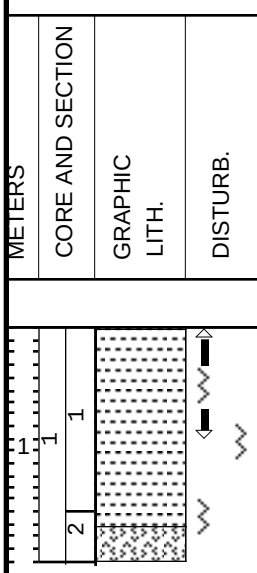
Core Photo

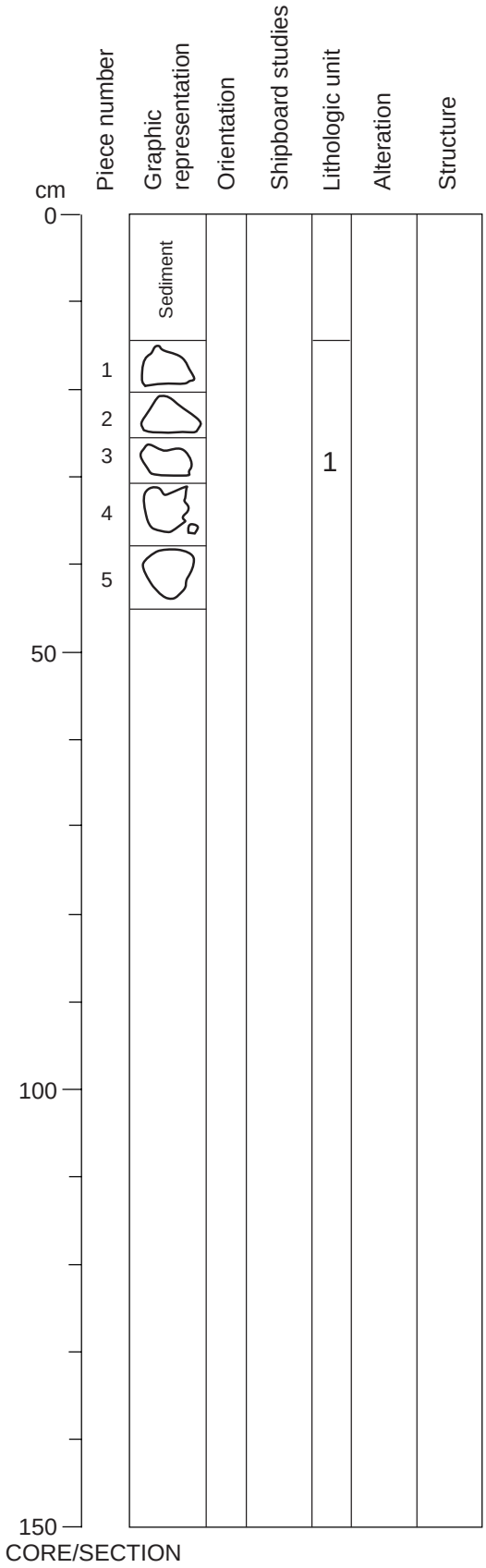
187-1158A-1W (0.0 -198.9 mbsf)



CLAY

From 0 to 60 cm in Section 187-1158A-1W-1 is normally graded. Drilling- induced fragments of siliceous clay range in size from 3 cm at the base of the interval to fine sand at the top. These fragments are an intimate mix of medium gray and medium brown clay, with medium brown pieces more abundant (roughly 2:1). From 60 to 90 cm is soupy brown clay and the archive half contains a silicified fragment 5 by 3 cm, that has a bifurcated "Y" shape with one of the arms broken off. From 90 to 108 cm is a highly drilling disturbed interval of medium brown clay. Between 108 and 143 cm is a gradational color change from medium brown to medium dark brown, all siliceous clay. From 143 to 150 cm is a densely packed medium dark brown clay that continues through the upper 3 cm of Section 1W-2. From 3 to 14 cm in Section 1W-2 is a highly drilling disturbed, medium brown siliceous clay. No calcareous clay was recovered in this wash barrel. Below the clay are several pieces of slightly to moderately altered aphyric basalt.

Core Photo



187-1158A-1W-2

UNIT 1: APHYRIC TO SPARSELY OLIVINE-PLAGIOCLASE PHYRIC BASALT

PIECES 1-5

INTERNAL CONTACTS: Pieces 1,2, and 5 have a glassy rind partially altered to palagonite (2 mm total width), which is strongly silicified (see alteration below).

PHENOCRYSTS:

	Abundance	**Size** (mm)			**Shape**
	%	**avg.**	**max.**	**min.**	
Plagioclase	~1	<1	<1	<1	prismatic
Olivine	1	<1	1	<1	euhedral
Total	~2				

GROUNDMASS: Microcrystalline to fine-grained

COLOR: Gray when fresh brown to brown-gray overall

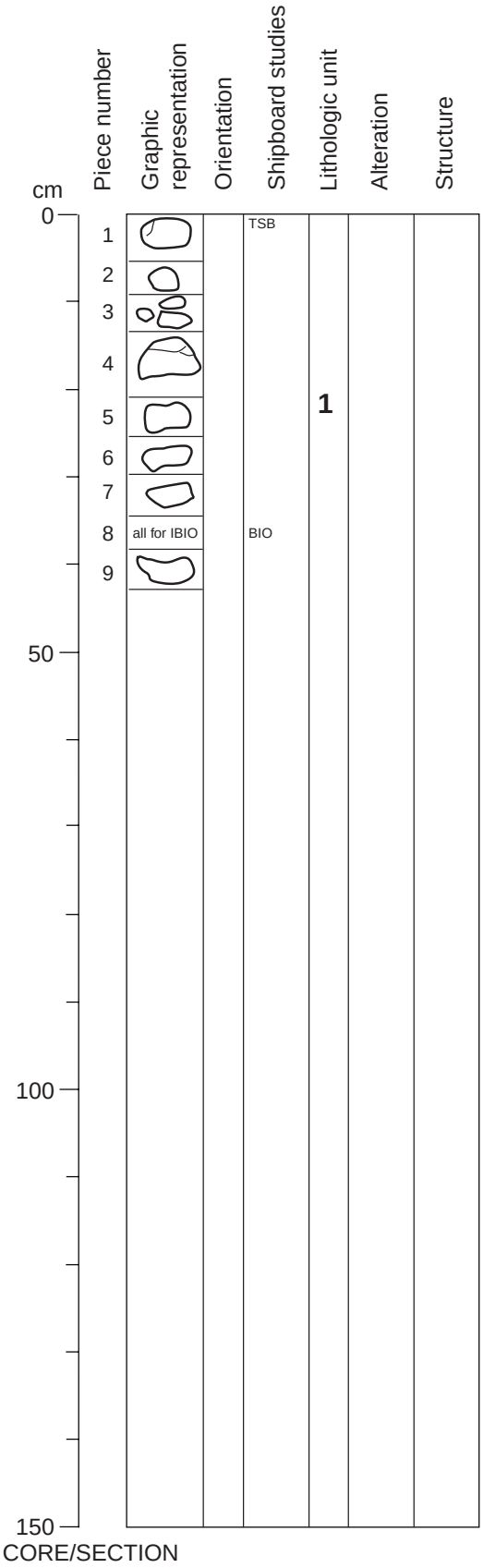
VESICLES: ~0.5 mm diameter, >1%

ALTERATION: In Piece 1 the palagonite has a 'cherty' appearance (sub-conchoidal fracture), Mn oxide is present in up to 30% of the cut glassy surface. The remaining ~70% is silica, present in two forms, blue cryptocrystalline silica and white botryoidal clusters of silica <<0.5 mm diameter. Overall there is a higher degree of silicification in this section than has been seen before in this leg. Blue cryptocrystalline silica and smectite lines vesicles throughout the section and white/blue cryptocrystalline silica coats platy minerals (probably Fe oxyhydroxide) replacing olivine. Piece 2 has white (bleached) alteration of the glass/chilled margin. Piece 2 has crystalline quartz/zeolite(?) filling a vesicle on a fracture which is orthogonal to the chilled margin. All pieces have weathered uncut edges, the oxidized zone is generally ~6 mm wide. Olivine has been partially replaced by Fe oxyhydroxide (<70%)in these zones. There is also replacement of groundmass by brown clays. Pink micrite dusts the outer surface of Pieces 1 and 2. Piece 5 has developed a significant Mn crust (~1 mm thick). All pieces have coatings of Mnoxides spots and silica on uncut surfaces.

STRUCTURE: Pillow lava as inferred from the glassy rinds and wedge shapes of Pieces 1, 2, and 5.

ADDITIONAL COMMENTS: Piece 5 is aphyric but the other pieces have between 1.5% and 2.5% phenocrysts, predominantly olivine.

Core Photo



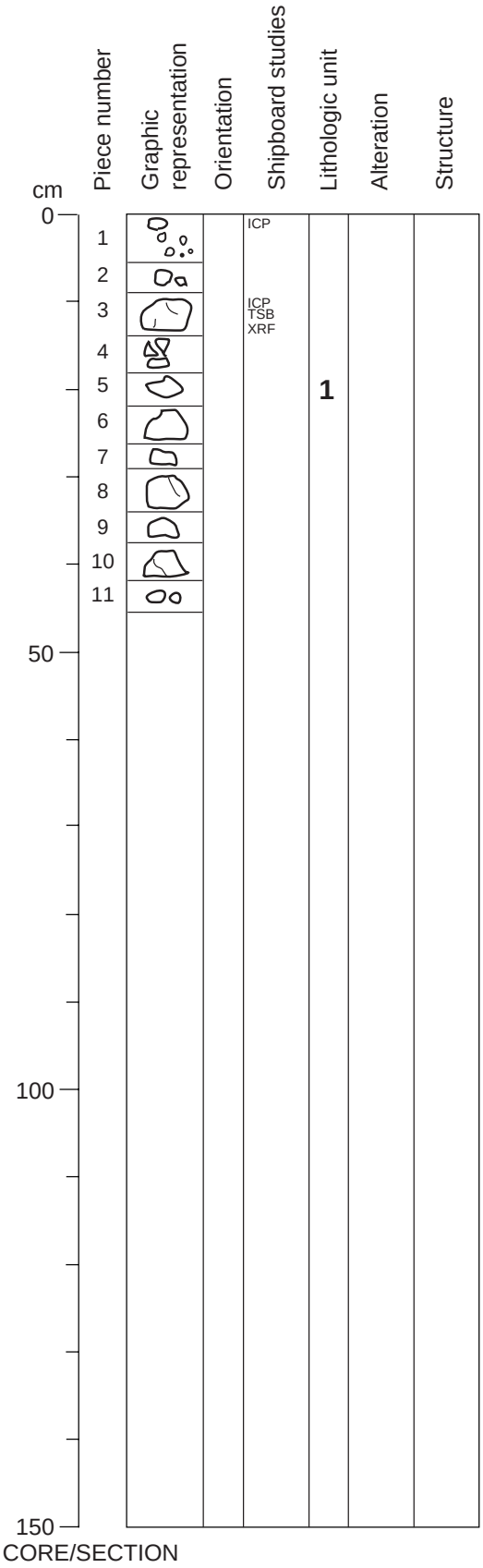
187-1158A-2R-1

UNIT 1: APHYRIC TO SPARSELY OLIVINE-PLAGIOCLASE PHYRIC BASALT

PIECES 1-9

GROUNDMASS: Fine-grained
COLOR: Gray when fresh, gray to brown when altered
VEINS/FRACTURES: Piece 4 has a ~1 mm vein filled with blue cryptocrystalline silica and Mn oxide.
ALTERATION: Some fine-grained groundmass has been replaced by a brown clay (e.g., Piece 1). In Pieces 6 chilled basalt has been replaced by gray clay and silica which highlights the spherulites. In Piece 9 the spherulites are surrounded by a brown alteration product. All pieces have some Mn oxide on the outside. On the outside of Piece 6 there is a crystalline quartz cemented sediment consisting of silicified orange palagonite and eroded spherulites with some olivine largely replaced by Fe oxyhydroxide. Oxidized margins around the outside of pieces are brown and ~8 mm wide on average. In Piece 3 white/blue/yellow material coats the inside of vesicles and cavities.
STRUCTURE: These pieces are pebble to cobble sized rubble.
ADDITIONAL COMMENTS: Piece 1, 2, 3, 5, and 7 are aphyric, Piece 3 has a granular textured groundmass with acicular plagioclase up to 2 mm. Piece 4 is sparsely olivine-plagioclase phyric with 1%-2% phenocrysts (<1 mm) of which ~20% are micro-glomerocrysts <1 mm. Pieces 6 and 9 have a very fine grained chilled texture with spherulites.

Core Photo



187-1158A-3R-1

UNIT 1:APHYRIC TO SPARSELY OLIVINE-PLAGIOCLASE PHYRIC BASALT

PIECES 1-11

INTERNAL CONTACTS: Glassy rind, ~1 mm fragment on Piece 1.

PHENOCRYSTS:

	Abundance	Size (mm)			Shape
	%	avg.	max.	min.	
Plagioclase	~0.5	<1	<1	<1	prismatic
Olivine	~1	<1	<1	<1	euhedral

GROUNDMASS: Fine-grained

COLOR: Medium gray

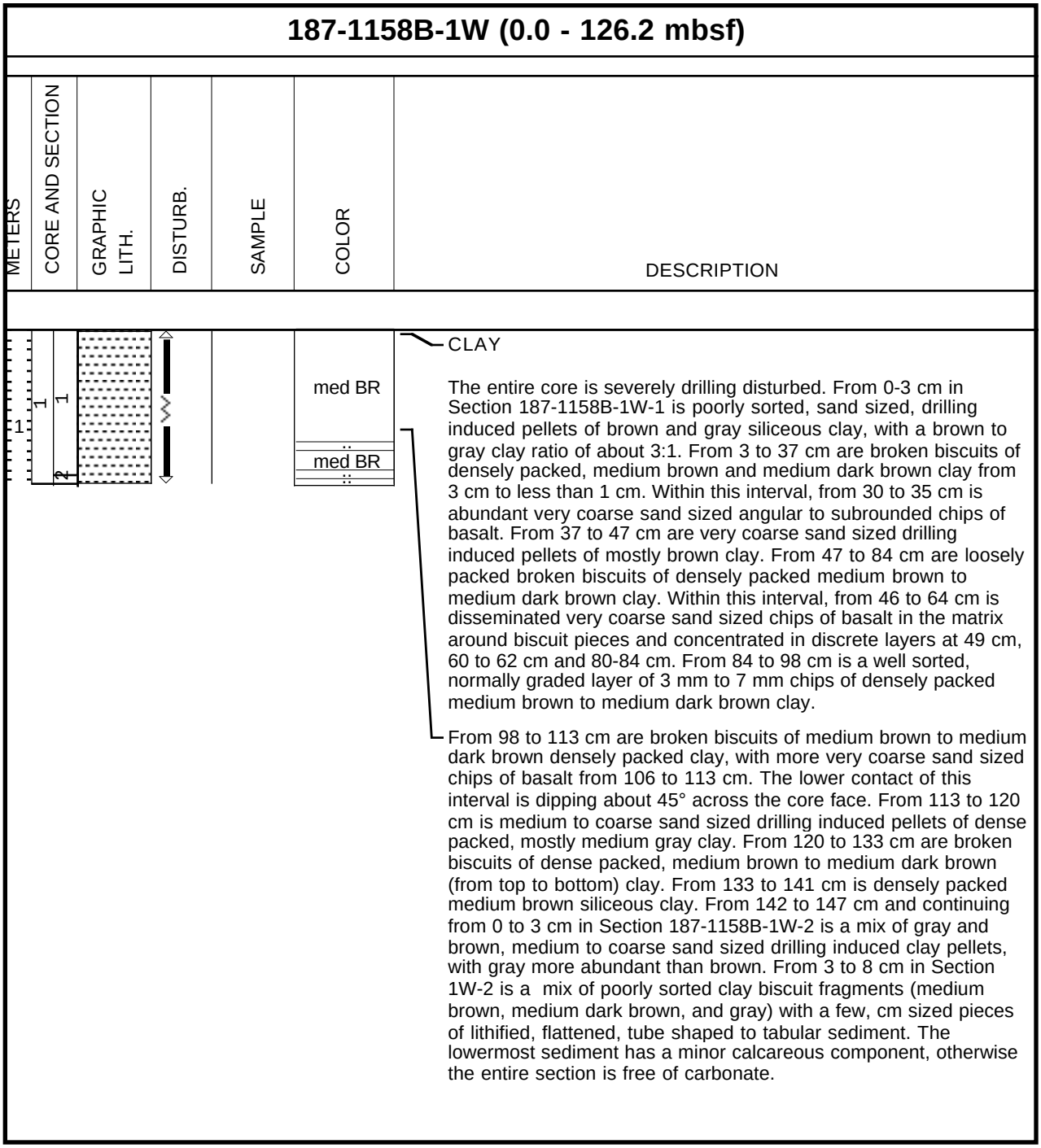
VEINS/FRACTURES: Piece 3 has a ~1 mm wide vein filled with silica and Fe stained material with a ~ 2 mm oxidized halo.

ALTERATION: Overall slight, olivine is generally fresh, replacement by Fe oxyhydroxide in the oxidized halo in Piece 3 and the ~4 mm weathered edge in Piece 6. Mn oxide spots are present on the outside of all pieces, usually associated with white cryptocrystalline silica. Piece 8 has cavities and vugs in the groundmass partially filled with Fe oxyhydroxide and silica. Vesicles (<0.5%) are lined with blue cryptocrystalline silica and smectite (e.g., Piece 5).

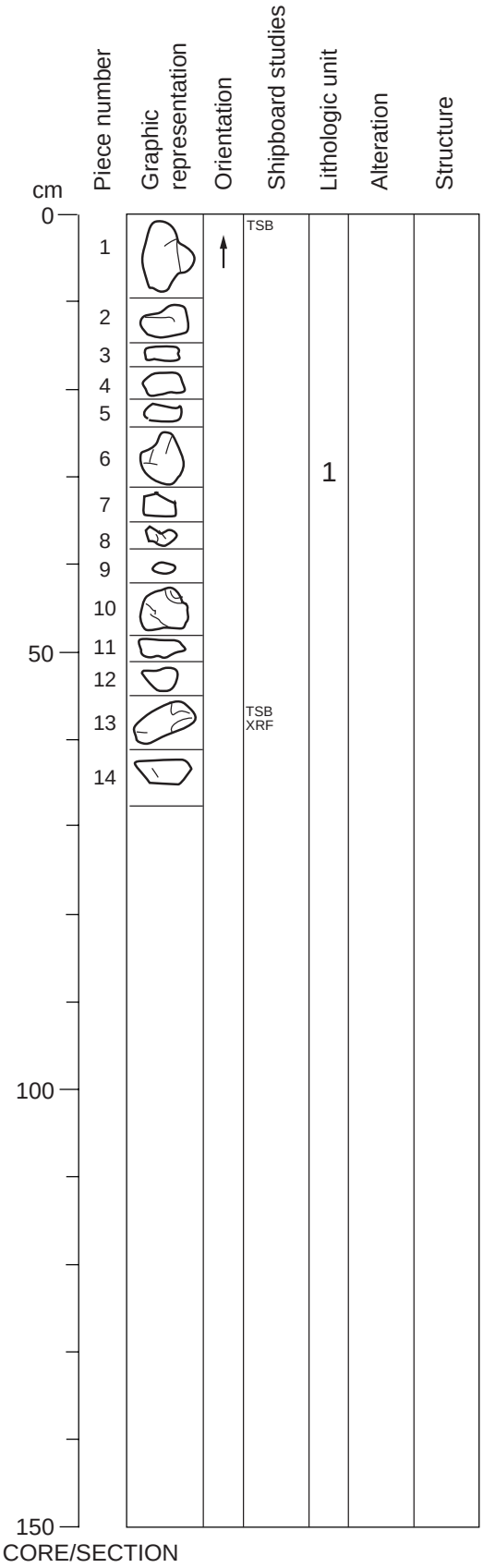
STRUCTURE: These pieces are pebble- to cobble-sized rubble.

ADDITIONAL COMMENTS: Piece 10 has ~2 mm diameter spherulites highlighted by alteration of the groundmass to a brown clay /silica(?) and is encrusted with cryptocrystalline silica, broken spherulites have Mn oxide inside them. Micro glomerocrysts of olivine and plagioclase (~1 mm) comprise the majority of the phenocrysts in this section. Pieces 2, 4, and 9 are aphyric.

Core Photo


187-1158B-1W (0.0 - 126.2 mbsf)
METERS
CORE AND SECTION
GRAPHIC LITH.
DISTURB.
SAMPLE
COLOR
DESCRIPTION
1
1
1
2
med BR
med BR
CLAY
The entire core is severely drilling disturbed. From 0-3 cm in Section 187-1158B-1W-1 is poorly sorted, sand sized, drilling induced pellets of brown and gray siliceous clay, with a brown to gray clay ratio of about 3:1. From 3 to 37 cm are broken biscuits of densely packed, medium brown and medium dark brown clay from 3 cm to less than 1 cm. Within this interval, from 30 to 35 cm is abundant very coarse sand sized angular to subrounded chips of basalt. From 37 to 47 cm are very coarse sand sized drilling induced pellets of mostly brown clay. From 47 to 84 cm are loosely packed broken biscuits of densely packed medium brown to medium dark brown clay. Within this interval, from 46 to 64 cm is disseminated very coarse sand sized chips of basalt in the matrix around biscuit pieces and concentrated in discrete layers at 49 cm, 60 to 62 cm and 80-84 cm. From 84 to 98 cm is a well sorted, normally graded layer of 3 mm to 7 mm chips of densely packed medium brown to medium dark brown clay.
From 98 to 113 cm are broken biscuits of medium brown to medium dark brown densely packed clay, with more very coarse sand sized chips of basalt from 106 to 113 cm. The lower contact of this interval is dipping about 45° across the core face. From 113 to 120 cm is medium to coarse sand sized drilling induced pellets of dense packed, mostly medium gray clay. From 120 to 133 cm are broken biscuits of dense packed, medium brown to medium dark brown (from top to bottom) clay. From 133 to 141 cm is densely packed medium brown siliceous clay. From 142 to 147 cm and continuing from 0 to 3 cm in Section 187-1158B-1W-2 is a mix of gray and brown, medium to coarse sand sized drilling induced clay pellets, with gray more abundant than brown. From 3 to 8 cm in Section 1W-2 is a mix of poorly sorted clay biscuit fragments (medium brown, medium dark brown, and gray) with a few, cm sized pieces of lithified, flattened, tube shaped to tabular sediment. The lowermost sediment has a minor calcareous component, otherwise the entire section is free of carbonate.

Core Photo



187-1158B-2R-1

UNIT 1: APHYRIC TO SPARSELY-OLIVINE-PLAGIOCLASE PHYRIC BASALT

PIECES 1-14

PHENOCRYSTS:	**Abundance**		**Size** (mm)		**Shape**
	%	**avg.**	**max.**	**min.**	
Plagioclase	0.5-1	1.5	5	~1	prismatic
Olivine	0.5-1	<1	2	<1	euhedral
Total	1-2				

GROUNDMASS: Almost microcrystalline to fine-grained

COLOR: Medium gray when fresh, brownish-light gray when altered

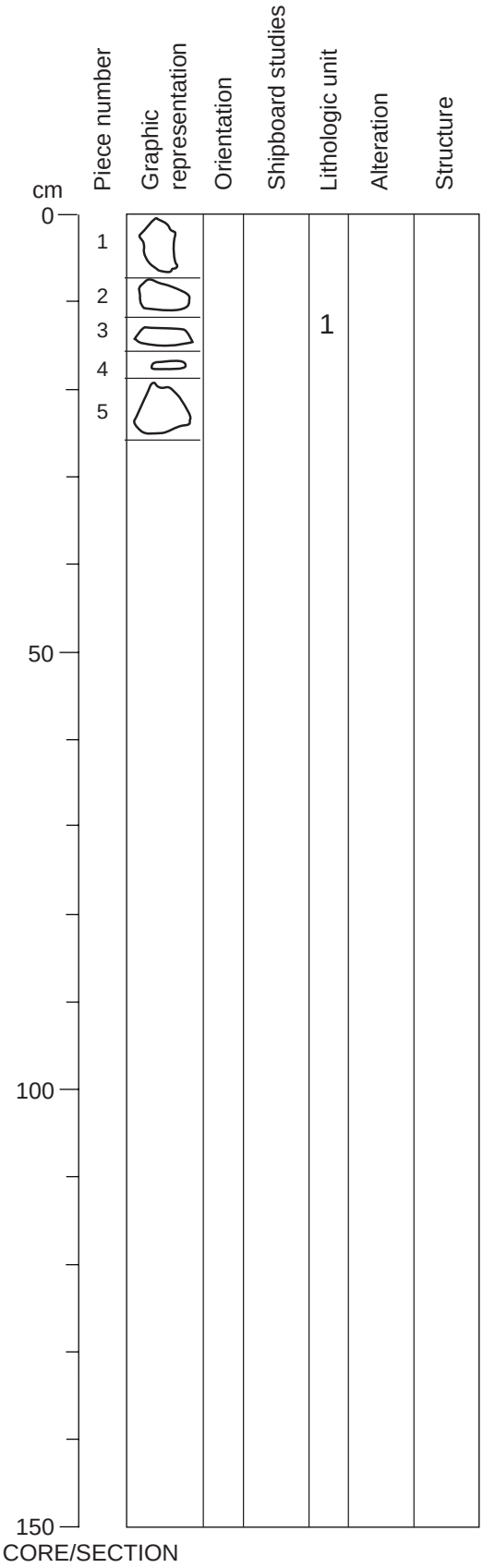
VEINS/FRACTURES: There are thin, <<0.5 mm, fractures in Pieces 1, 6, 10 (filled with silica and Fe-stained material), and 13 the latter is crenelated. The fracture in Piece 6 has a 1 mm wide oxidized halo around it.

ALTERATION: Overall slightly altered. Olivine has largely (~70%) been replaced by Fe oxyhydroxide in the majority of pieces, more rarely by smectite (e.g., Piece 6). There is some (<3%) replacement of plagioclase by cream-white clay, especially close to the outer edges (e.g Piece 1). Groundmass has been partially replaced by Fe oxyhydroxide and smectite (<10% overall). In Pieces 1 and 2 groundmass alteration imparts a brown color to the cut face. In other pieces alteration is restricted to an oxidized margin associated with weathered edges, ranging from 0.5 mm in Piece 5 to 15 mm in Piece 4. There is a marked absence of surficial coatings such as Mn oxide spots, silica, or sediment, on the outside edges of this section (unlike previous sites

STRUCTURE: Pebble- to cobble-sized rubble

ADDITIONAL COMMENTS: Although this section is described as one unit there are marked differences between the pieces, Piece 1 has the most abundant (~2%) and largest phenocrysts, approximately 40% of which make up glomerocryst up to 8 mm long. The groundmass has visible clinopyroxene infilling felty textured plagioclase (~1 mm) and a granular texture. Pieces 2, 3, 4 and 7 have a similar granular texture to Piece 1 but finer grained and with fewer phenocrysts (~1%). Pieces 5, 6, and 8 are fine-grained-microcrystalline, aphyric, and lack the granular texture. Pieces 10 to 14 are coarser grained than Piece 1 with a similar granular texture, but the groundmass is still generally <1. Piece 10 has a 15 mm long cluster of altered olivine crystals with interlocking plagioclase.

Core Photo



187-1158B-3R-1

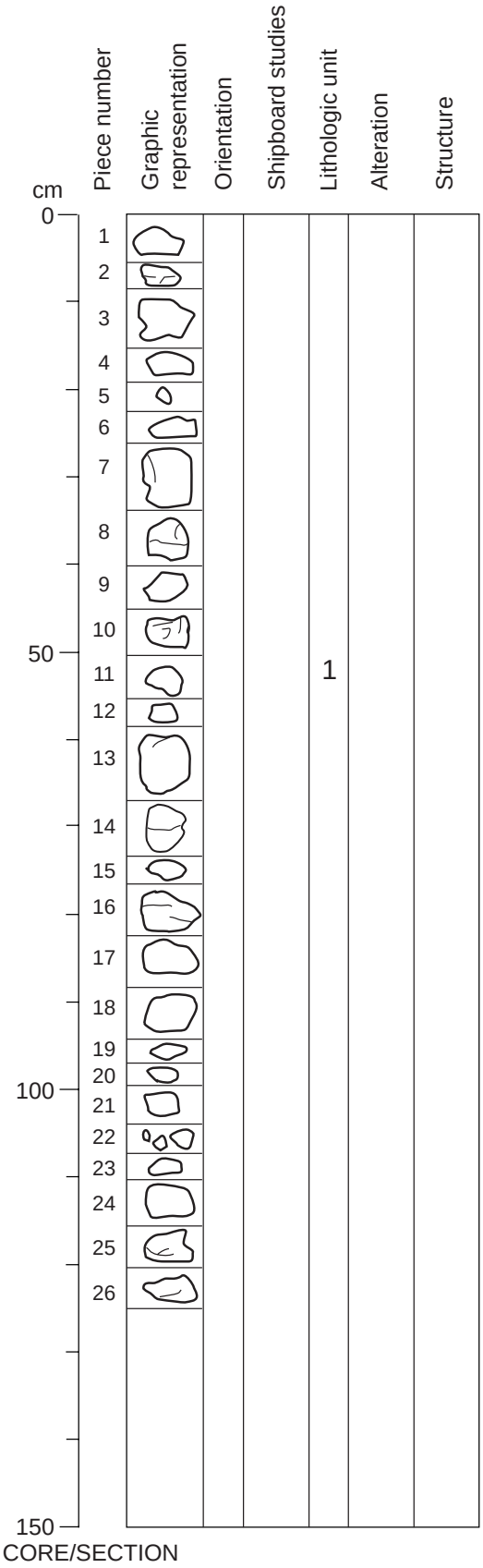
UNIT 1: APHYRIC TO SPARSELY OLIVINE-PLAGIOCLASE PHYRIC BASALT

PIECES 1-5

PHENOCRYSTS:	**Abundance**		**Size** (mm)		**Shape**
	%	**avg.**	**max.**	**min.**	
Plagioclase	<1-1	<1	1.5	<1	prismatic
Olivine	<1-1	<1	2	<1	euhedral
Total	<2-2				

GROUNDMASS: Fine-grained
VESICLES: Rare (<<1%) vesicles filled with manganese in Piece 1.
COLOR: Medium gray to brownish-light gray when altered
ALTERATION: Overall the section is slightly altered. Olivine has largely (~80%) been replaced by Fe oxyhydroxide in the majority of pieces, but a creamy clay commonly fills cavities that are lined with Fe oxyhydroxide. This may be a two-stage replacement where olivine is replaced by Fe oxyhydroxide which in return is replaced by the creamy clay (e.g., Piece 5). Groundmass has been partially replaced by Fe oxyhydroxide and creamy clay (<10% overall). Piece 1 has a ~15 mm oxidized margin associated with weathered edges. There is a marked absence of surficial coatings such as Mn oxide spots (a few grains of Mn oxide on Piece 3), silica, or sediment, on the outside edges of this section (unlike previous sites).
STRUCTURE: Pebble- or cobble-sized rubble
ADDITIONAL COMMENTS: The pieces in this section have a wide range of groundmass crystal sizes, similar to Section 1158B-2R-1, but all crystals are < 1mm. Piece 2 has a similar granular texture to Piece 3 in 1158B-2R-1. Piece 2 also has olivine and plagioclase glomerocrysts (up to 4 mm) made up of ~40% of the phenocrysts. Pieces 3 and 4 have very fine-grained groundmass.

Core Photo



187-1158B-4R-1

UNIT 1: APHYRIC TO SPARSELY OLIVINE-PLAGIOCLASE PHYRIC BASALT

PIECES 1-26

INTERNAL CONTACTS: Glassy rinds and/or chilled margins are present in Pieces 1, 2, 4, 8, and 10. In all pieces the glass is generally altered, to palagonite with associated quartz veins and/or coated with blue cryptocrystalline silica. Chilled margins have groundmass replaced by either a white-gray mixture of clay and silica(?) or a brown Fe oxyhydroxide, the spherulites (up to 1.5 mm diameter) are a pale tan-brown (e.g Piece 4)..

PHENOCRYSTS:

	Abundance	**Size** (mm)			**Shape**
	%	**avg.**	**max.**	**min.**	
Plagioclase	~0.5	1	2	<1	prismatic rounded
Olivine	~1-1.5	0.8	2	<1	euhedral
Total	1.5-2				

GROUNDMASS: Microcrystalline to fine-grained

COLOR: Buff-brown or whitish gray when altered, medium gray when fresh.

VESICLES:

Abundance	**Size** (mm)			**Shape**
%	**avg.**	**max.**	**min.**	
0.5-1	0.5	0.8	<0.5	round

Filling: Various including Mn oxide and smectite or lined with blue (pink/mauve/white) cryptocrystalline silica (e.g., Piece 3).

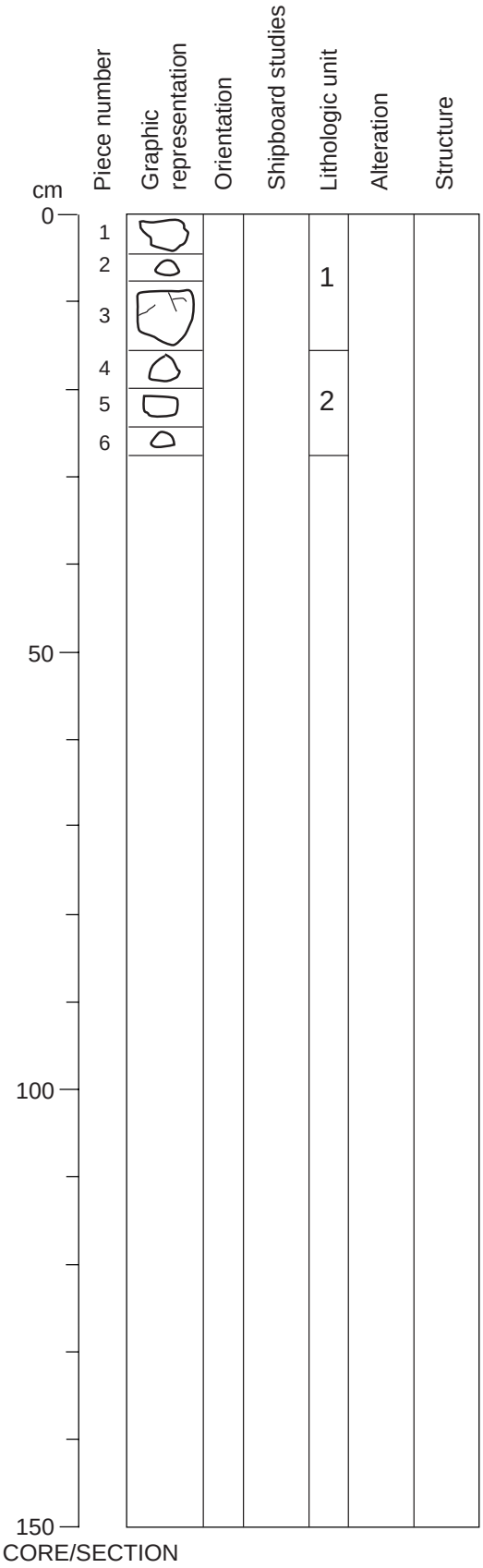
VEINS/FRACTURES: Open fractures in Piece 2, 8 10, 13, 14, and 17, all <1 mm. In Piece 8 blue cryptocrystalline silica lines the fracture. Piece 14 has an oxidized margin 8 mm across. In Piece 2 the fractures can be seen to nucleate along phenocryst alignments. Thin (<0.2 mm) discontinuous ‘ stringers’ of quartz 10-15 mm long in Piece 7.

ALTERATION: Overall moderate, some pieces especially those with large chilled margins are highly altered (e.g., 1, 2, and 4).
Outer surfaces are generally weathered (e.g., brown to brown-red in Piece 1, resulting in a high number of pieces with oxidized margins, only Pieces 11, 13, 15, 17, 23, and 26 do not have oxidized margins. The oxidized margins range from 2 mm in Piece 21 to 10 mm in Piece 4. Mn oxide spots (~1 mm diameter) are associated with cryptocrystalline and crystalline silica on the outer surfaces of most pieces, and in Piece 6 with concentric nodules of silicified palagonite. Olivine has been partially (~65%) replaced by Fe oxyhydroxide or smectite, the former in oxidized zones. Approximately 10%-20% of the groundmass has been replaced by either Fe oxyhydroxide or smectite.

STRUCTURE: Five pieces have relict glassy rinds but there is no other evidence for pillow lavas. The majority of the pieces are pebble- to cobble-sized rubble.

ADDITIONAL COMMENTS: Rounded large (~1 mm) plagioclase occurs in Pieces 3, 10, and 14.

Core Photo



187-1158C-1W-1

UNIT 1: APHYRIC BASALT

PIECES 1-3

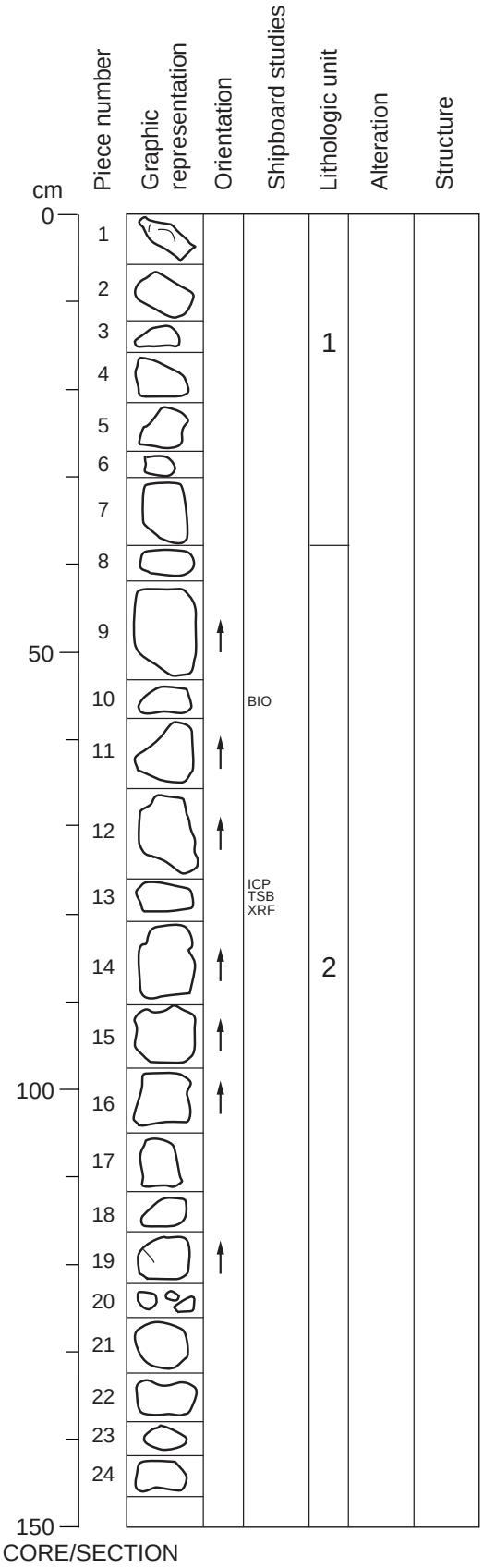
INTERNAL CONTACTS: Glassy rind (<1 mm thick) present on Piece 2 (working half only). The glass is altered to palagonite with associated quartz veins and cryptocrystalline silica. The chilled margin has groundmass replaced by either a white-gray mixture of clay and silica(?).
GROUNDMASS: Microcrystalline to fine-grained
COLOR: Medium gray
VEINS/FRACTURES: Open fractures (<1 mm wide) in Piece 3, with a 2 mm wide oxidized halo towards the outer surface of the piece.
ALTERATION: Moderately altered, ~20% replacement of groundmass by Fe oxyhydroxide and smectite. There is an absence of any other coatings, e.g., silica and Mn oxide spots
STRUCTURE: Not distinguishable
ADDITIONAL COMMENTS: Piece 3 has felty textured plagioclase (1 mm) in the groundmass. The three pieces all have weathered outer surfaces and are pebble-to cobble-sized rubble.

UNIT 2: DIABASE

PIECES 4-6

GROUNDMASS: Medium-grained
COLOR: Gray to brownish-gray
ALTERATION: Replacement of olivine in groundmass by Fe oxyhydroxide has resulted in Fe-staining of plagioclase giving the unit a more altered appearance than it actually is. There is ~5% olivine in this unit of which ~45% is altered. The outer surfaces of the pieces are weathered brown. There is an absence of any other coatings, e.g., silica and Mn oxide spots
STRUCTURE: None
ADDITIONAL COMMENTS: Piece 5 has ~1% vesicles lined with Fe-stained cryptocrystalline silica. The groundmass (>1 mm) has a sugary texture giving the rock a granular appearance. Clinopyroxene appears to have an ophitic texture, being interstitial to the plagioclase and olivine. The texture of this unit is similar to, but coarser-grained than the granular texture seen in Section 1158B-2R-1 Pieces 1, 2, 3, 4, 7, and 10 to 14, and in Section 1158B-3R 1 Piece 2.

Core Photo



187-1158C-2R-1

UNIT 1: APHYRIC BASALT

PIECES 1-7

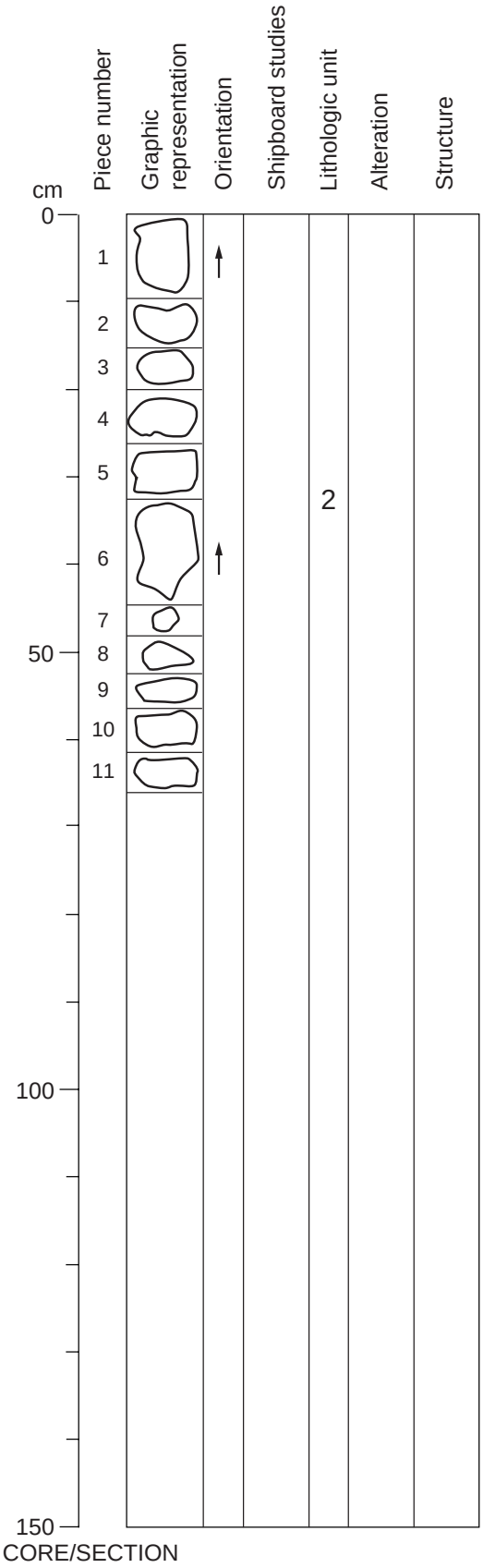
GROUNDMASS: Fine-grained overall but Pieces 5 and 6 are granular whereas ~1 mm plagioclase forms a felty interlocking texture in Pieces 2, 3, 4, and 7.
COLOR: Medium gray to gray
VEINS/FRACTURES: 2-3 mm long fractures in Piece 1; <1 mm wide coated with smectite.
ALTERATION: All pieces have smectite and Fe oxyhydroxide replacing 60% of olivine in the groundmass. Overall slight to moderate. There is a marked absence of surficial coatings such as Mn oxide spots (except for a Mn oxide crust on Piece 5), silica, or sediment, on the outside edges of this section (unlike previous sites).
STRUCTURE: None distinguishable.
ADDITIONAL COMMENTS: Vesicles (<1%) are filled with smectite and/or Fe oxyhydroxide. In Piece 7 there is 7% olivine in the groundmass of which only ~10% is altered.

UNIT 2: DIABASE

PIECES 8-24

GROUNDMASS: Medium-grained to fine-grained
COLOR: Gray to Brownish-gray
ALTERATION: Replacement of olivine in groundmass by Fe oxyhydroxide has resulted in Fe-staining of plagioclase giving the unit a more altered appearance than it actually is. There is ~5% olivine in this unit of which ~45% is altered. Vesicles are ~0.8 mm and filled with smectite, a pale cream fibrous mineral(?), or more rarely Mn oxide. Pieces 19 to 24 are more altered than the rest of this unit, ~10% of plagioclase has been replaced by a pale clay. The top of Piece 9 and bottom of Piece 14 have an oxidized zone ~ 15 mm wide, defined by an increased abundance of Fe oxyhydroxide. There is a marked absence of surficial coatings such as Mn oxide spots, silica, or sediment, on the outside edges of this section (unlike previous sites).
STRUCTURE: None, although this section could be interpreted as a chilled top and base with coarser grained material in the middle.
ADDITIONAL COMMENTS: Pieces 19 to 24 are finer grained than the rest of this unit, with Piece 24 being finer grained than Pieces 19 to 23. Plagioclase is still ~1 mm in all 5 pieces, but has a felty texture, and is similar to Piece 7 of unit 1. There are rare plagioclase 'macrocrysts' between 3 and 5 mm (e.g., Piece 9). Clinopyroxene tends to be euhedral in this section (e.g., Piece 14), unlike Section 187-1158C-1W-1.

Core Photo



187-1158C-2R-2

UNIT 2: DIABASE

PIECES 1-11

GROUNDMASS: Medium- to fine-grained
COLOR: Brownish-gray
VESICLES:

Abundance	Size (mm)			Shape
%	avg.	max.	min.	
5-7	0.7	1	0.2	rounded

Filling: Infilled by pale yellow-tan concentrically zoned cryptocrystalline silica and clay(?).

ALTERATION: Slightly altered overall. Replacement of olivine in groundmass by Fe oxyhydroxide has resulted in Fe-staining of plagioclase, and infilling of vesicles by a cream-tan clay/silicate gives the unit a more altered appearance than it actually is. There is a marked absence of surficial coatings such as Mn oxide spots, silica, or sediment, on the outside edges of this section (unlike previous sites).

STRUCTURE: None, although this section could be interpreted as a continuation of the base of Section 2R-1.

ADDITIONAL COMMENTS: There is a systematic decrease in crystal size with depth in this section. Plagioclase defines a felty texture and ranges from ~1 mm in Pieces 1, 2, and 3, to <0.5 mm in Pieces 6 to 11.

187-1158A-2R-1, 0-4 cm (TS #45) **Unit: 1** **OBSERVER:** **Gee**

ROCK NAME: **Fresh aphyric basalt with a highly vesicular chilled margin**
WHERE SAMPLED: **piece 1**
GRAIN SIZE: **fine grained to microcrystalline**
TEXTURE: **intersertal**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	SIZE (mm) max.	SIZE (mm) av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
PHENOCRYSTS								
Plagioclase								
Olivine								
Clinopyroxene								
GROUNDMASS								
Olivine	~1	~2	0.08	0.2	0.09		skeletal	
Plagioclase	~55	~55	0.4	3	1.8		hollow elongate 'box structures', also sehak and spherulitic arrangements	Image 111: cross-section of parallel growth plagioclase box-texture' up to 2 mm long. A combination of parallel growth and sheaf texture produce the felty texture apparent in hand specimen.
Clinopyroxene	~15	~20						
Opaque Minerals	~2	~2						
Glass	~10	~21						

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	SIZE (mm) max.	SIZE (mm) av.	REPLACING / FILLING	COMMENTS
Clays	~11				glass/clinopyroxene	

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm) min.	SIZE (mm) max.	SIZE (mm) av.	FILLING / MORPHOLOGY	COMMENTS
Vesicles	25	Top 2.5 cm	0.2	1	0.4	mainly unfilled (~95%), some clay. Rounded to globular.	Vesicularity increases from the top to the bottom of the thin section, i.e., from 0% to 25%.

COMMENTS : Groundmass modes exclude vesicles.

187-1158A-3R-1, 10-13 cm (TS#46) **Unit: 1** **OBSERVER:** **Gee**

ROCK NAME: **Fresh sparsely olivine phyric basalt (avesicular)**
WHERE SAMPLED: **piece 3**
GRAIN SIZE: **fine grained to microcrystalline**
TEXTURE: **intersertal**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	SIZE (mm) max.	SIZE (mm) av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
PHENOCRYSTS								
Plagioclase								
Olivine	~2-3	~2-3	0.05	1	0.6		skeletal to equant	Seriate so min size is groundmass, glomerocrysts of 4/5 olivine crystals include ~40% of total phenocrysts. Clear glass melt inclusions in equant phenocryst olivine.
Clinopyroxene								
GROUNDMASS								
Olivine	~4	~4					equant to skeletal	
Plagioclase	~60	~60					prismatic to acicular and hollow	Sheaf, radial and trachytic plagioclase, some bow-tie with olivine, often 'snowball' effect around olivine glomerocrysts (Image 112).
Clinopyroxene	~14	~14					prismatic	
Opaque Minerals								
Glass	~18	~19						

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	SIZE (mm) max.	SIZE (mm) av.	REPLACING / FILLING	COMMENTS
Clays	~1				glass in groundmass	
opaques	<1			<0.02	in altered glass	

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm) min.	SIZE (mm) max.	SIZE (mm) av.	FILLING / MORPHOLOGY	COMMENTS

COMMENTS :

187-1158B-2R-1, 0-3 cm (TS#47) **Unit: 1** **OBSERVER:** **Gee**

ROCK NAME: **Diabase, slightly altered**
WHERE SAMPLED: **piece 1**
GRAIN SIZE: **medium grained**
TEXTURE:

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	SIZE (mm) max.	SIZE (mm) av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
PHENOCRYSTS								
Plagioclase	2	~2.5	1	5	4		Subhedral laths (broken)	Disequilibrium textures, e.g. disrupted twin planes, sieve texture, oscillatory concentic zoning (Image 113), and overgrowths.
Olivine								
Clinopyroxene								
GROUNDMASS								
Olivine								
Plagioclase	46	48	0.8	3	1.2			Fe-staining of plagioclase, some radial intergrowth with clinopyroxene.
Clinopyroxene	40	46	0.8	2.5	1.5			
Opaque Minerals	3	3	0.02	0.2	0.1		skeletal to euhedral	Resorbed/skeletal and with overgrowths, mainly magnetite some exsolved ilmenite and rare sulphides.
Glass								

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	SIZE (mm) max.	SIZE (mm) av.	REPLACING / FILLING	COMMENTS
Clays	~6.5				phenocrystic plagioclase along fractures and in sieve texture, and groundmass clinopyroxene.	

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm) min.	SIZE (mm) max.	SIZE (mm) av.	FILLING / MORPHOLOGY	COMMENTS

COMMENTS : The thin section has a brown colouration which is mainly due to Fe-staining of plagioclase, the alteration is not above 10% overall, but there is an area at the bottom of the TS where alteration is ~20-30%, nearly all clinopyroxene is affected to some degree. Image 113 illustrates typical groundmass texture and a plagioclae phenocryst but is more altered than the majority of the TS.

187-1158B-2R-1, 55-58 cm (TS#48) **Unit:1** **OBSERVßER:** **Gee**

ROCK NAME: **Slightly altered sparsely plagioclase-olivine phyric basalt**
WHERE SAMPLED: **piece 13**
GRAIN SIZE: **fine grained**
TEXTURE: **sub ophitic**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	SIZE (mm) max.	SIZE (mm) av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
PHENOCRYSTS								
Plagioclase	1		0.6	2	1.4		laths, anhedral to subhedral	Plagioclase glomerocrysts up to 2 mm as well as single crystals. Disrupted twinning, oscillatory concentric zoning and ragged/ broken crystals.
Olivine	0	1	0.6	1.4	1.2		skeletal	Totally replaced.
Clinopyroxene	<<1			0.7			euhedral	Sector zoned.
GROUNDMASS								
Olivine								
Plagioclase	48		0.2	0.5	0.4		prismatic	
Clinopyroxene	33	40	0.2	0.8	0.6		anhedral	Clinopyroxene partially encloses plagioclase (sub ophitic) or forms radial growths with plagioclase. In sub ophitic areas the clinopyroxene may have unulose extinction.
Opaque Minerals	1				<0.02			
Glass	2	8						

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	SIZE (mm) max.	SIZE (mm) av.	REPLACING / FILLING	COMMENTS
Clays	14				glass in groundmass and olivine	

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm) min.	SIZE (mm) max.	SIZE (mm) av.	FILLING / MORPHOLOGY	COMMENTS
	<<1				0.6	clays	

COMMENTS : Plagioclase and olivine glomerocrysts are up to 4 mm across, all olivine has been replaced by a complex intergrowth of clays and a high birefringence mineral with straight extinction (Image 114). Areas with smaller clinopyroxene may be the end-product of the strain dislocation seen in other areas of the TS. (Images 117 and 118).

187-1158C-2R-1, 75-78 cm (TS#49) **Unit:2** **OBSERVER:** **Gee**

ROCK NAME: **Diabase, slight to moderately altered**
WHERE SAMPLED: **piece 13**
GRAIN SIZE: **medium grained**
TEXTURE: **sub ophitic**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	SIZE (mm) max.	SIZE (mm) av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
PHENOCRYSTS								
Plagioclase								
Olivine								
Clinopyroxene								
GROUNDMASS								
Olivine								
Plagioclase	48	49		4	2			Some dislocation twinning.
Clinopyroxene	38	49		4	3			All clinopyroxenes have some strain extinction, often radiating, the degree of strain varies from slight to almost dislocation, ie up to 6 degrees dislocation in the crystal lattice.
Opaque Minerals	2						skeletal/equant	Magnetite and ilmenite (ilmenite exsolution along cleavage planes).
Glass								

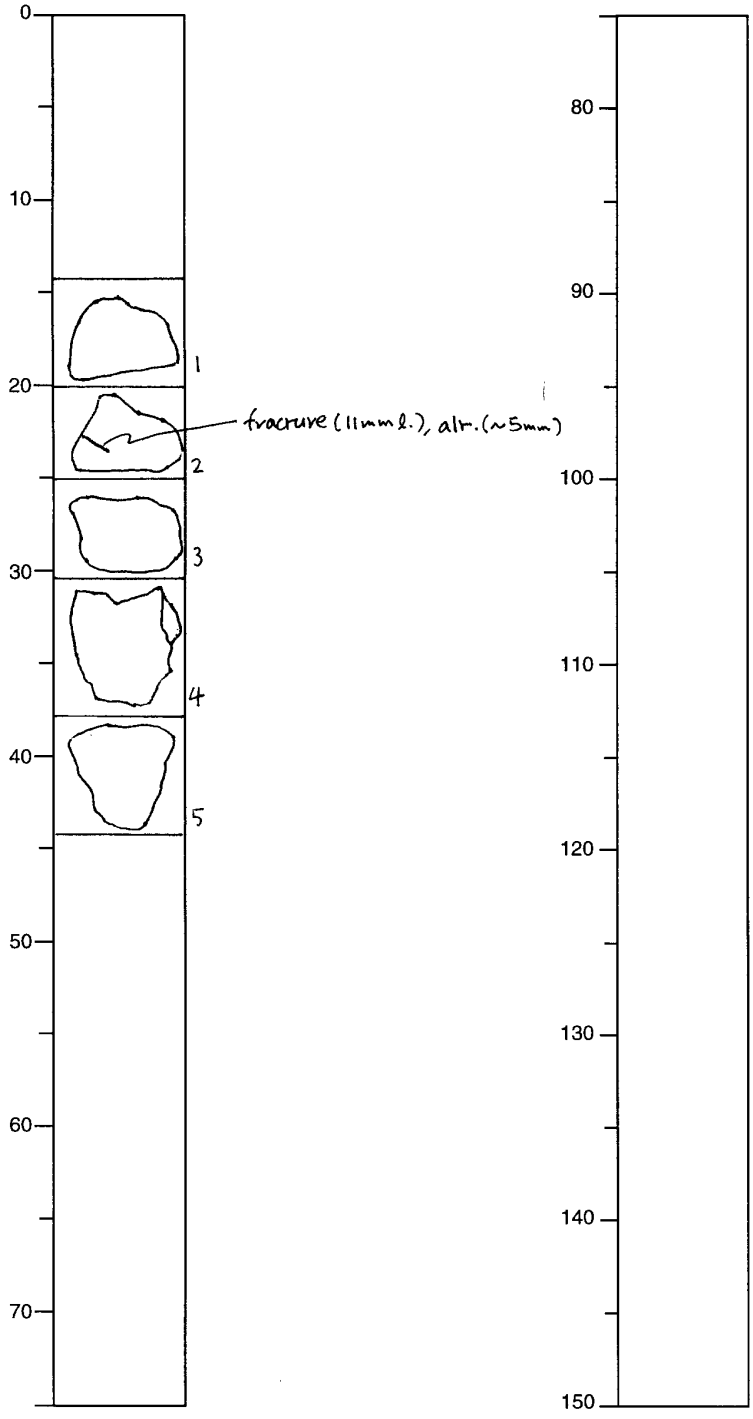
SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	SIZE (mm) max.	SIZE (mm) av.	REPLACING / FILLING	COMMENTS
Clays	11				clinopyroxene	
Fe oxyhydroxides	1				clinopyroxene	

VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm) min.	SIZE (mm) max.	SIZE (mm) av.	FILLING / MORPHOLOGY	COMMENTS
Vesicles	<1						

COMMENTS : Radiating clusters of plagioclase and clinopyroxene as well as sub ophitic texture. Clinopyroxene size is difficult to measure because of the strain extinction and the sub ophitic texture. Overall alteration is slight but locally moderate, i.e. all clinopyroxene replaced by clays and iddingsite. Plagioclase is Fe-stained.

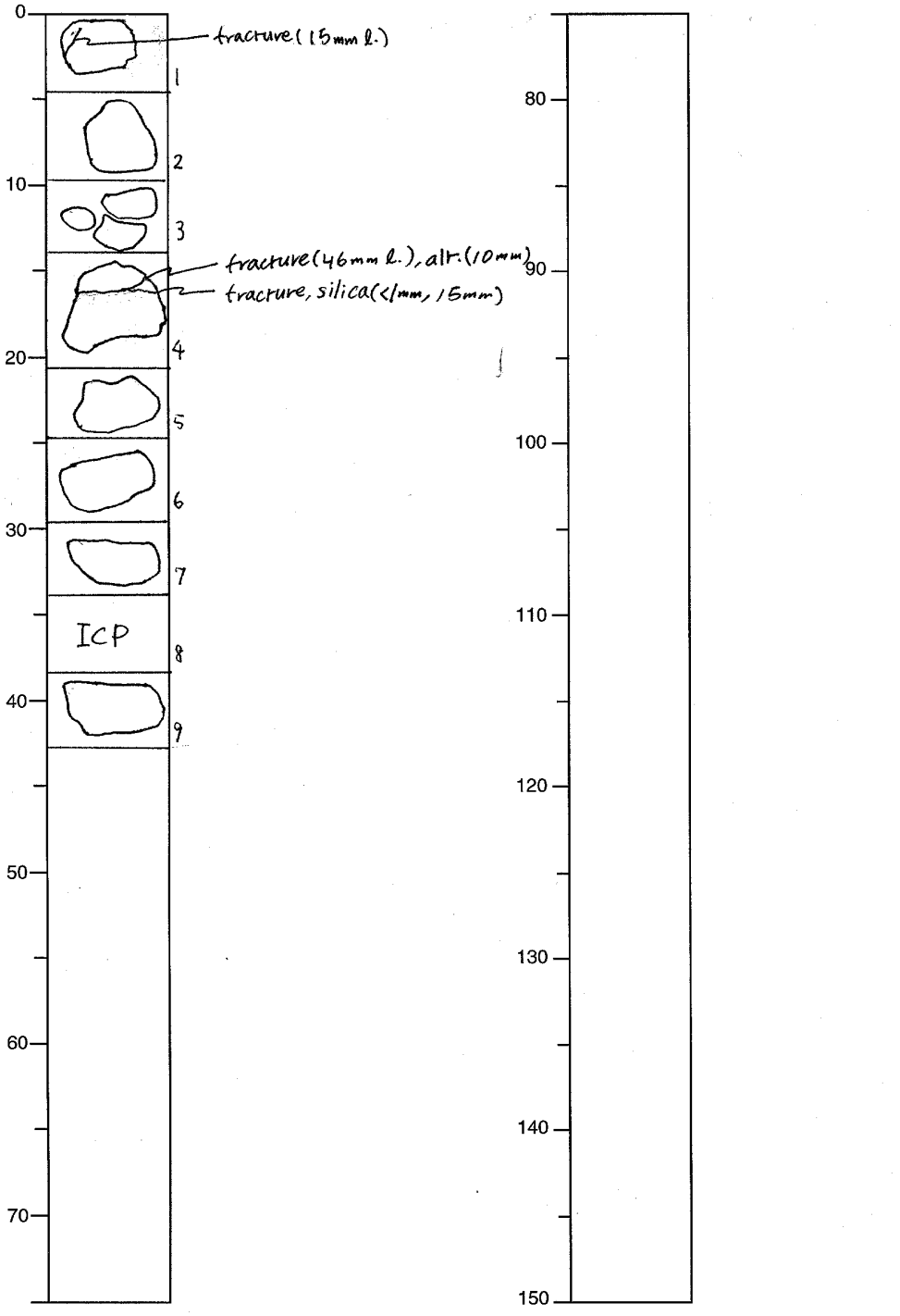
STRUCTURAL GEOLOGY DESCRIPTION

Leg	Hole	Core	Section
187	1158A	1W	2



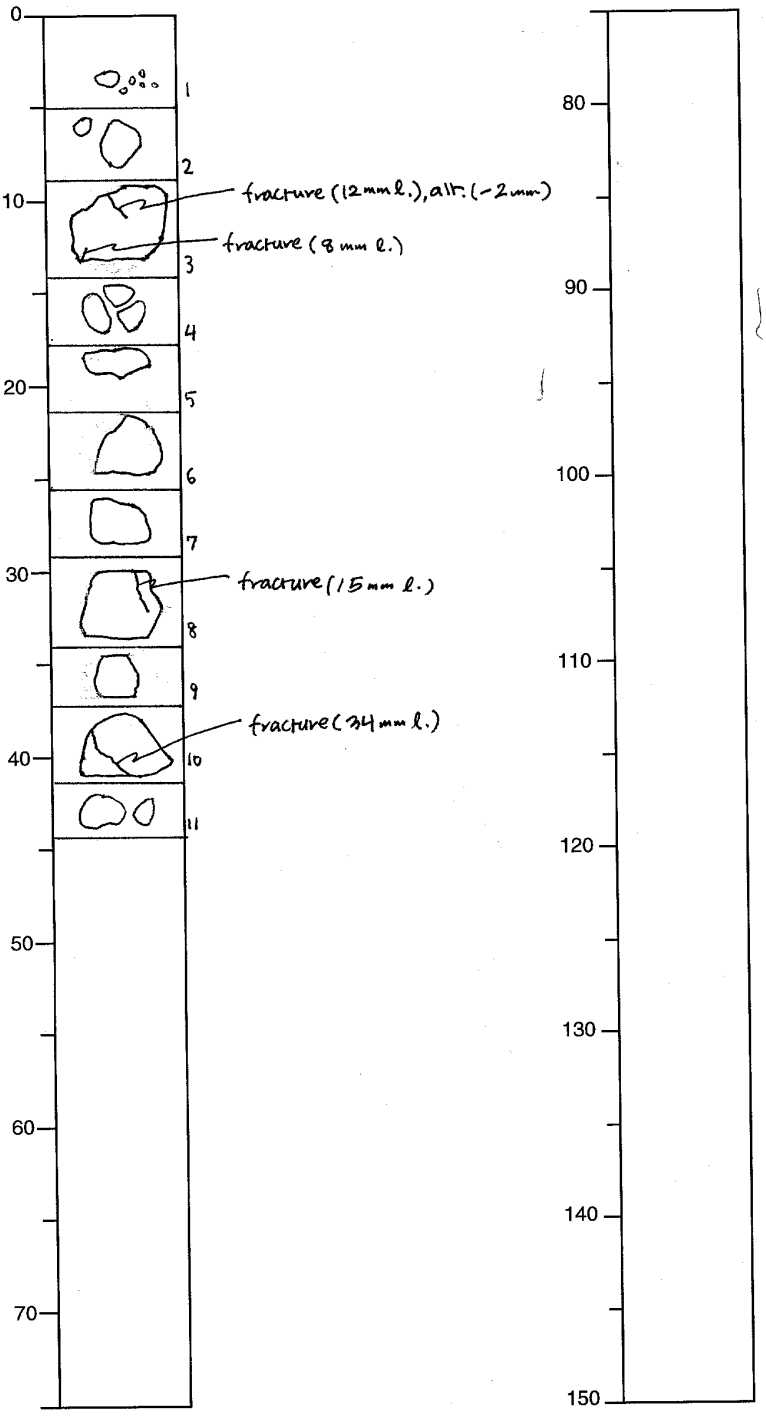
STRUCTURAL GEOLOGY DESCRIPTION

Leg	Hole	Core	Section
187	1158A	2R	1



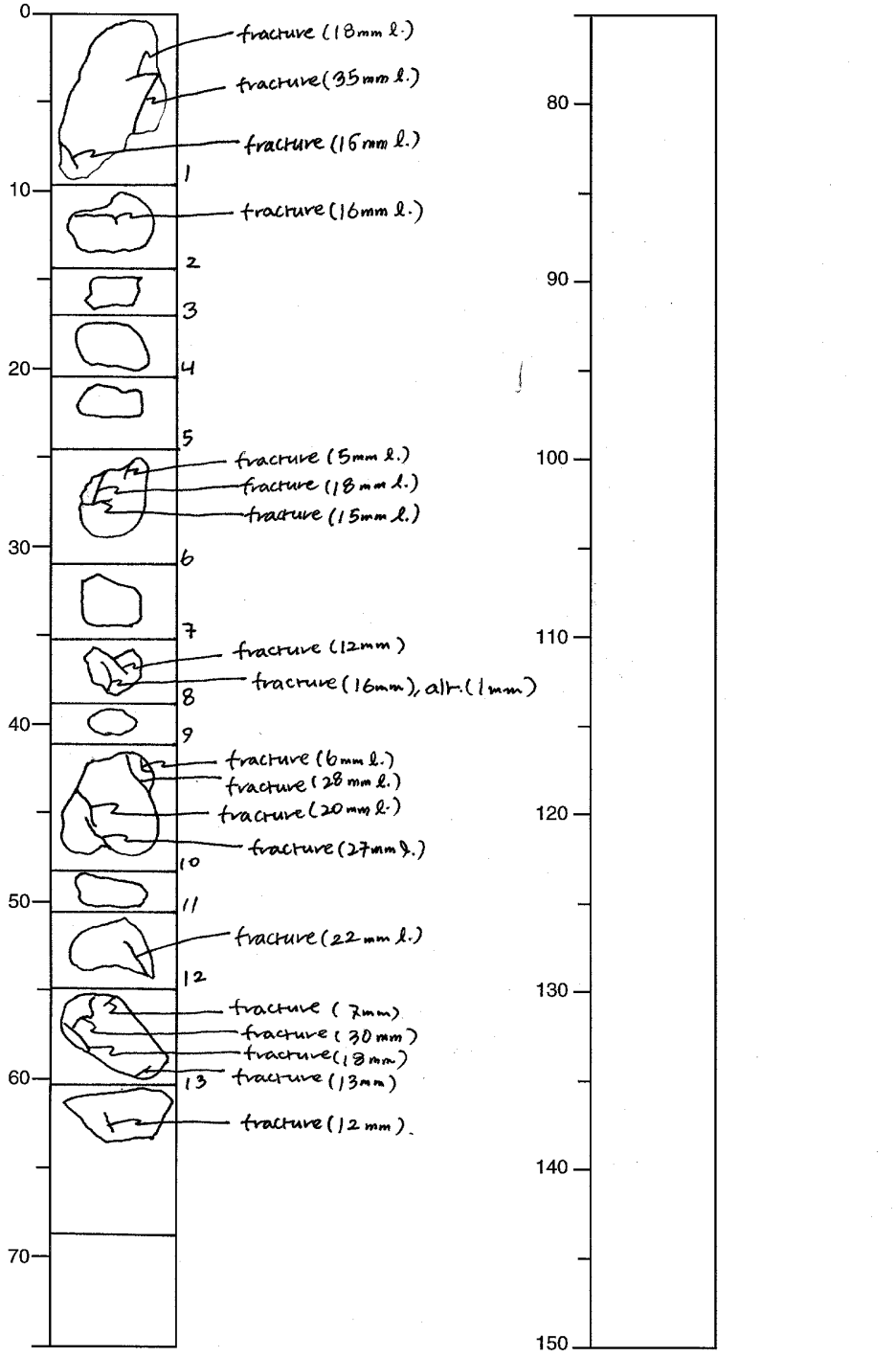
STRUCTURAL GEOLOGY DESCRIPTION

Leg	Hole	Core	Section
187	1158A	3R	1



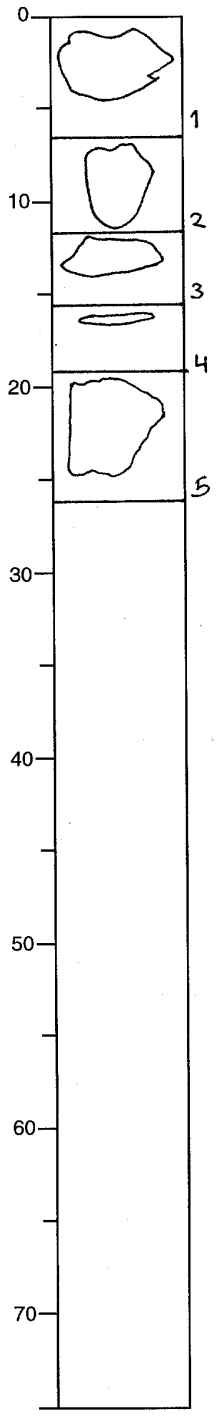
STRUCTURAL GEOLOGY DESCRIPTION

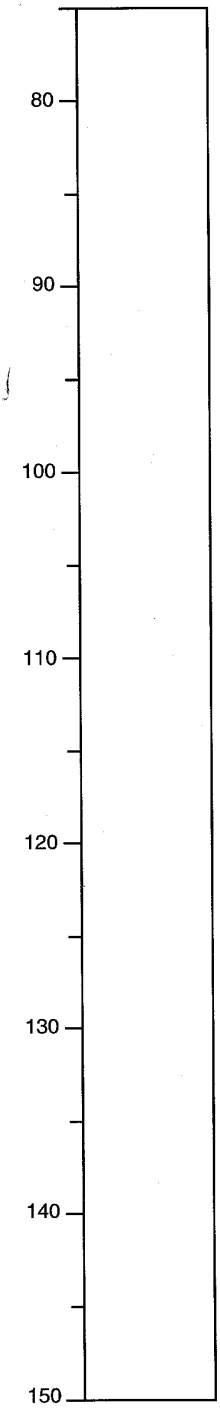
Leg	Hole	Core	Sectio
187	1158B	2R	1.



STRUCTURAL GEOLOGY DESCRIPTION

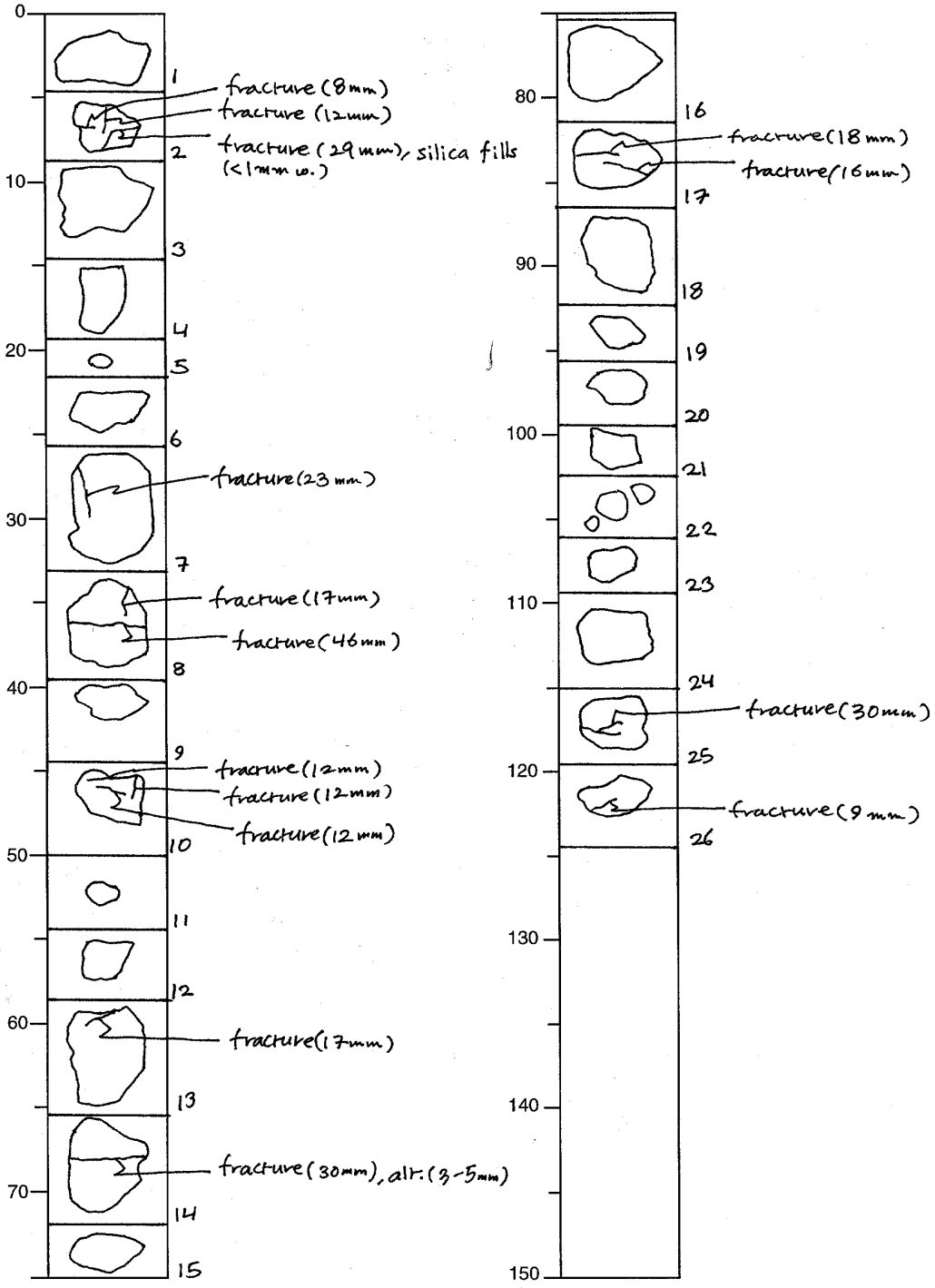
Leg	Hole	Core
187	1158B	3R





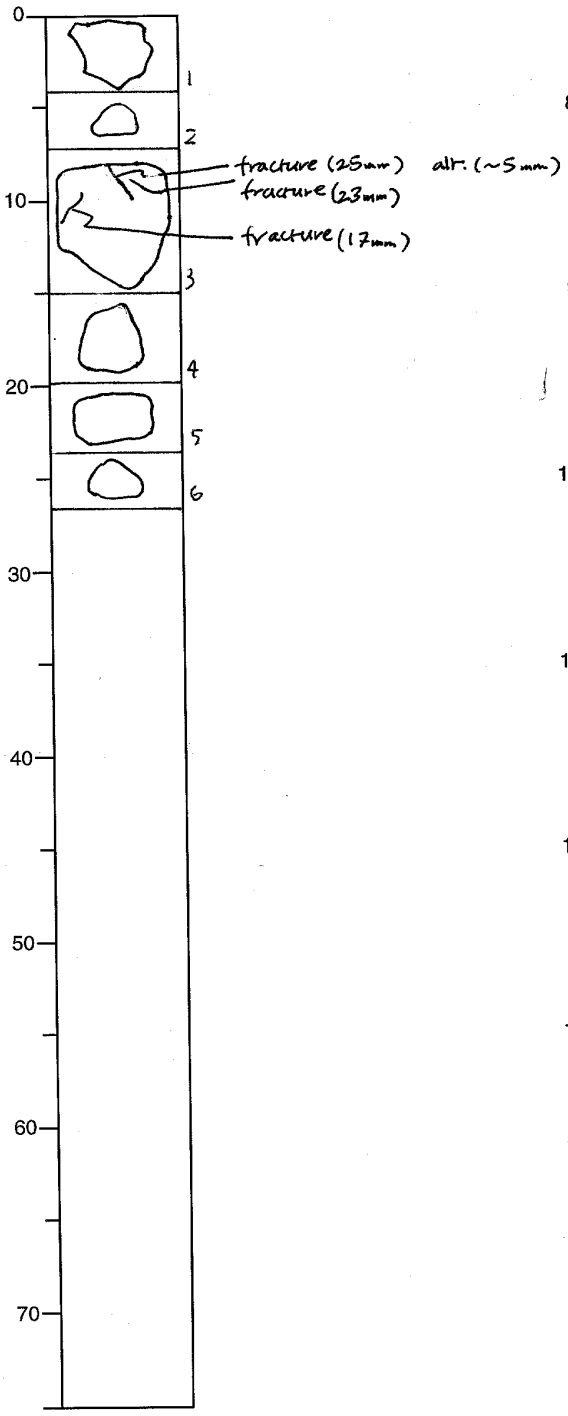
STRUCTURAL GEOLOGY DESCRIPTION

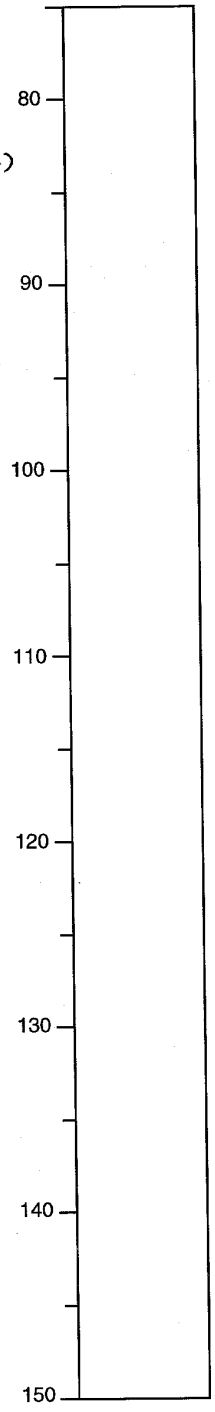
Leg	Hole	Core	Section	Observer
187	1158B	4R	1.	H.S.



STRUCTURAL GEOLOGY DESCRIPTION

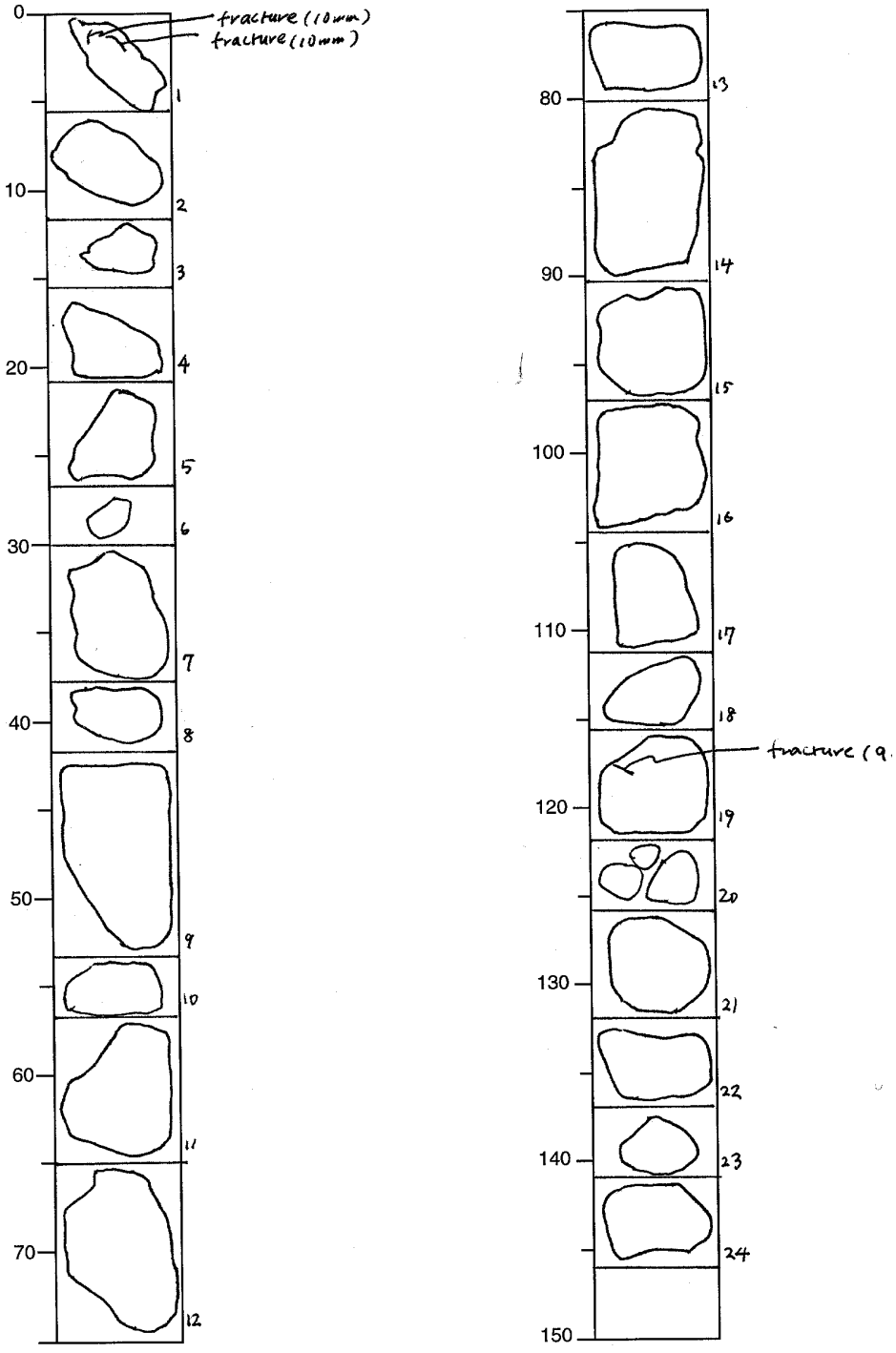
Leg	Hole	Core	Section
187	1158C	1W	1





STRUCTURAL GEOLOGY DESCRIPTION

Leg	Hole	Core	Sectio
187	1158C	2R	1



STRUCTURAL GEOLOGY DESCRIPTION

Leg	Hole	Core	Section
187	1158C	2R	2