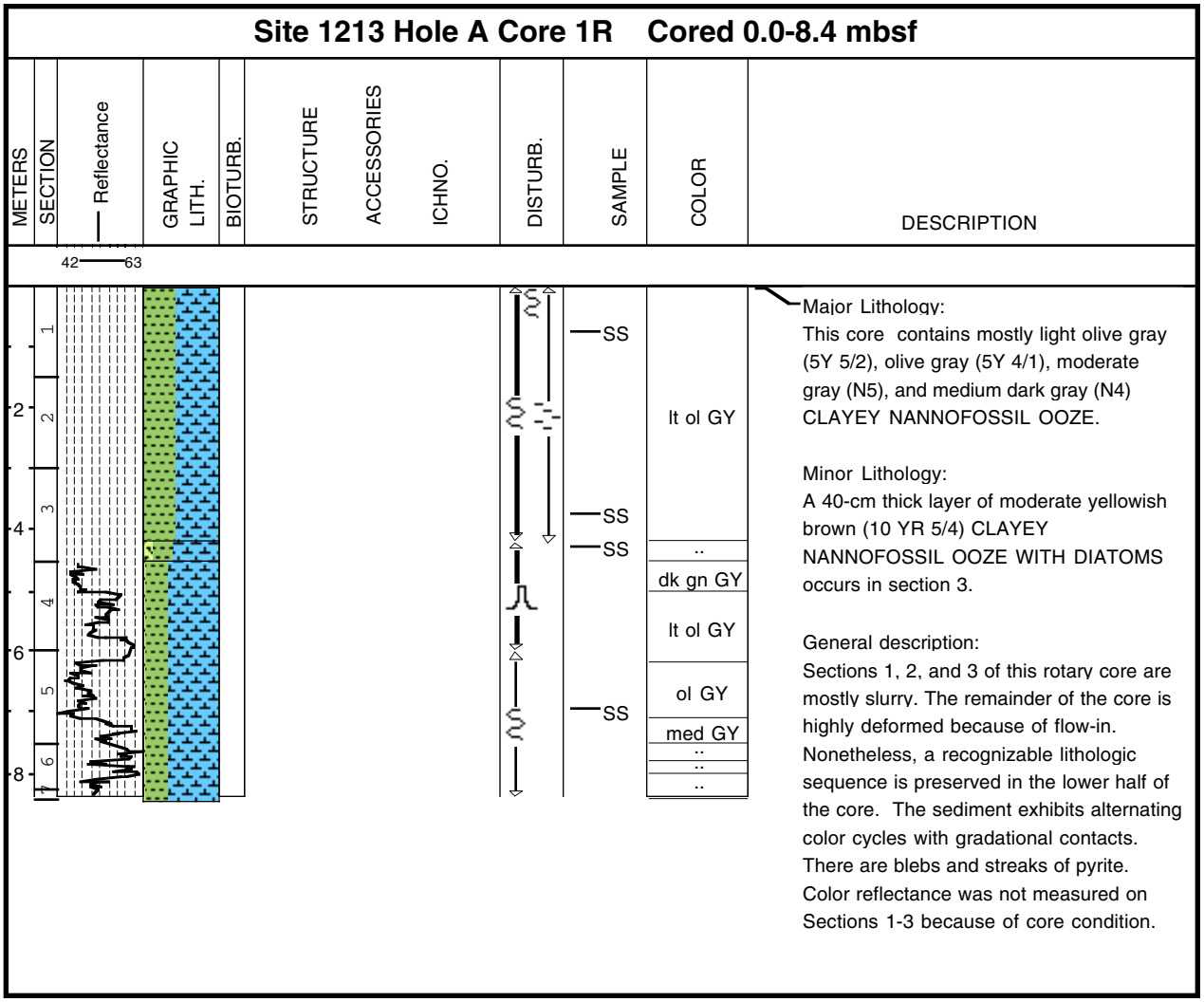
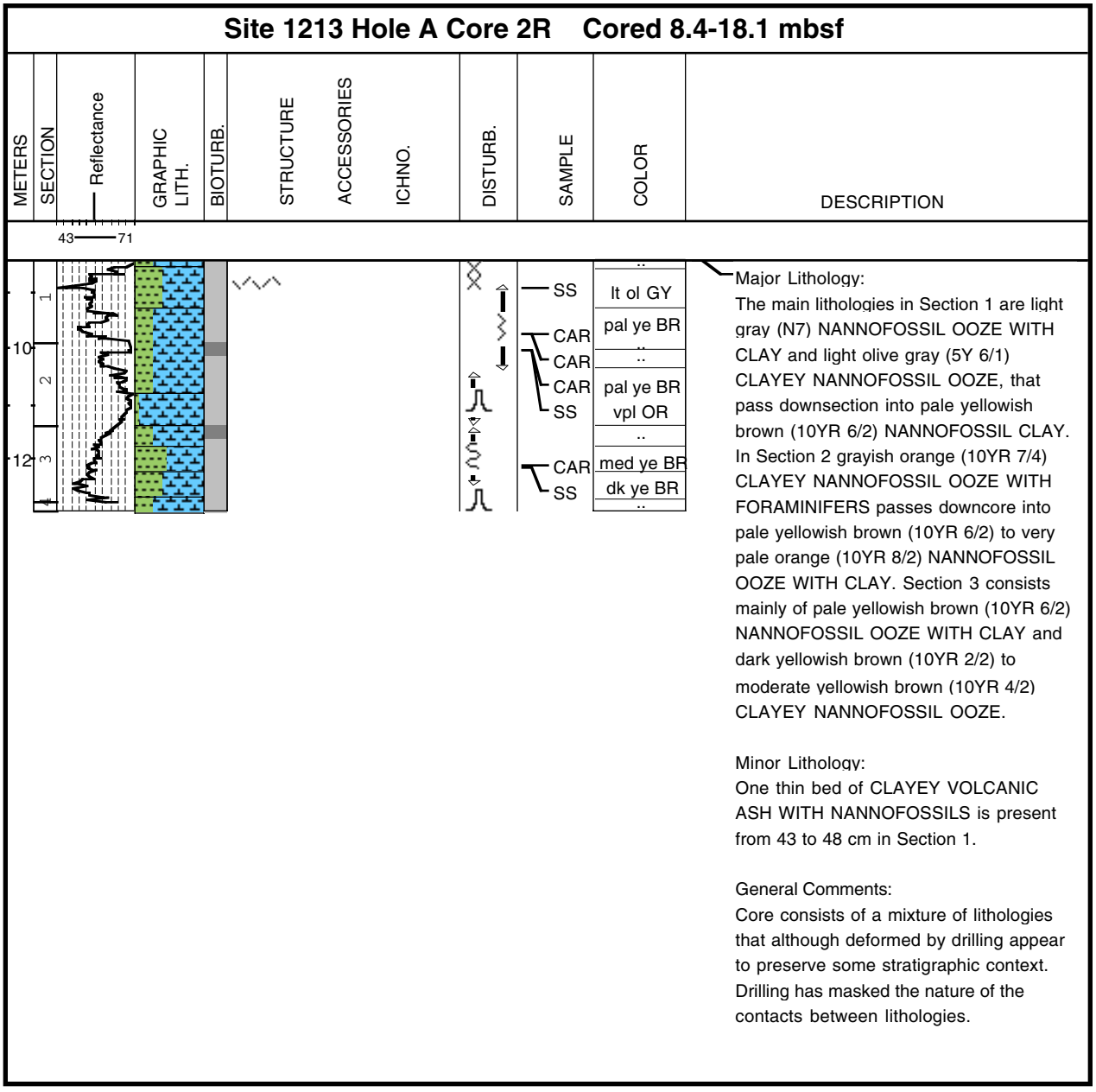
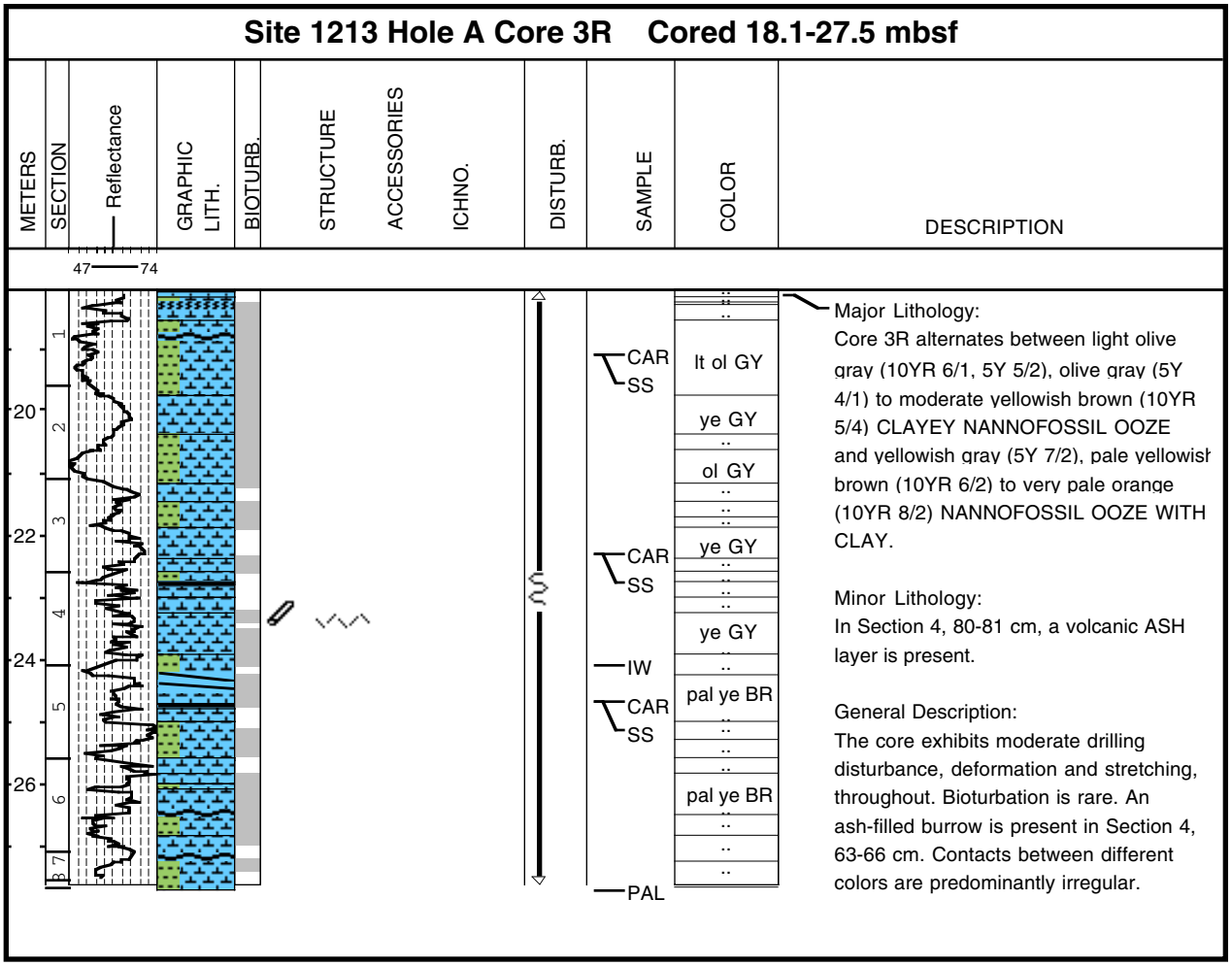
Core Photo


Site 1213 Hole A Core 1R Cored 0.0-8.4 mbsf
METERS
SECTION
Reflectance
42
63
GRAPHIC LITH.
BIOTURB.
STRUCTURE
ACCESSORIES
ICHNO.
DISTURB.
SAMPLE
COLOR
DESCRIPTION
2
4
6
8
1
2
3
4
5
6
SS
SS
SS
SS
lt ol GY
dk gn GY
lt ol GY
ol GY
med GY
Major Lithology:
This core contains mostly light olive gray (5Y 5/2), olive gray (5Y 4/1), moderate gray (N5), and medium dark gray (N4) CLAYEY NANNOFOSSIL OOZE.
Minor Lithology:
A 40-cm thick layer of moderate yellowish brown (10 YR 5/4) CLAYEY NANNOFOSSIL OOZE WITH DIATOMS occurs in section 3.
General description:
Sections 1, 2, and 3 of this rotary core are mostly slurry. The remainder of the core is highly deformed because of flow-in. Nonetheless, a recognizable lithologic sequence is preserved in the lower half of the core. The sediment exhibits alternating color cycles with gradational contacts. There are blebs and streaks of pyrite. Color reflectance was not measured on Sections 1-3 because of core condition.

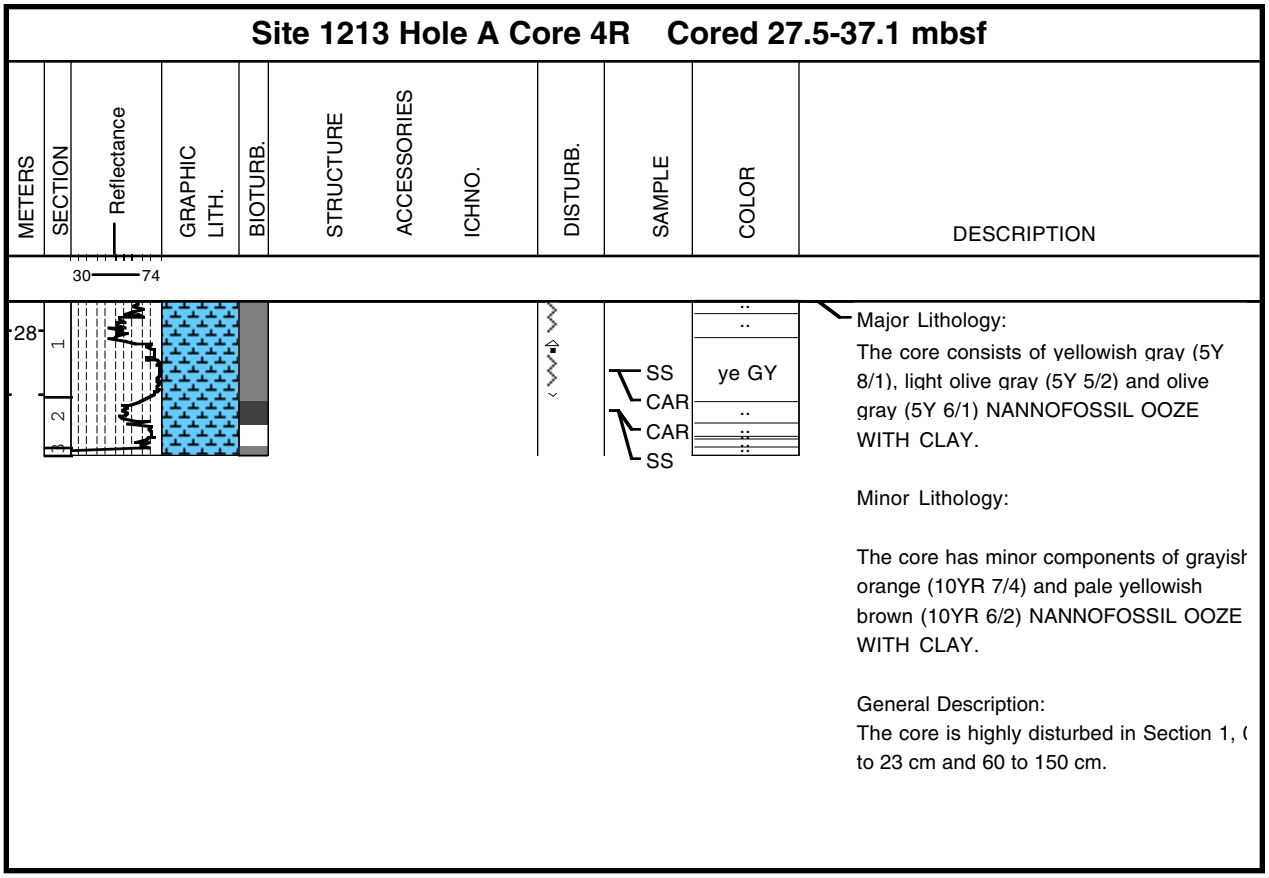
Core Photo


Site 1213 Hole A Core 2R Cored 8.4-18.1 mbsf
METERS
SECTION
Reflectance
43
71
GRAPHIC LITH.
BIOTURB.
STRUCTURE
ACCESSORIES
ICHNO.
DISTURB.
SAMPLE
COLOR
DESCRIPTION
10
12
1
2
3
4
SS
CAR
CAR
CAR
SS
CAR
SS
lt ol GY
pal ye BR
pal ye BR
vpl OR
med ye BR
dk ye BR
Major Lithology:
The main lithologies in Section 1 are light gray (N7) NANNOFOSSIL OOZE WITH CLAY and light olive gray (5Y 6/1) CLAYEY NANNOFOSSIL OOZE, that pass downsection into pale yellowish brown (10YR 6/2) NANNOFOSSIL CLAY. In Section 2 grayish orange (10YR 7/4) CLAYEY NANNOFOSSIL OOZE WITH FORAMINIFERS passes downcore into pale yellowish brown (10YR 6/2) to very pale orange (10YR 8/2) NANNOFOSSIL OOZE WITH CLAY. Section 3 consists mainly of pale yellowish brown (10YR 6/2) NANNOFOSSIL OOZE WITH CLAY and dark yellowish brown (10YR 2/2) to moderate yellowish brown (10YR 4/2) CLAYEY NANNOFOSSIL OOZE.
Minor Lithology:
One thin bed of CLAYEY VOLCANIC ASH WITH NANNOFOSSILS is present from 43 to 48 cm in Section 1.
General Comments:
Core consists of a mixture of lithologies that although deformed by drilling appear to preserve some stratigraphic context. Drilling has masked the nature of the contacts between lithologies.

Core Photo

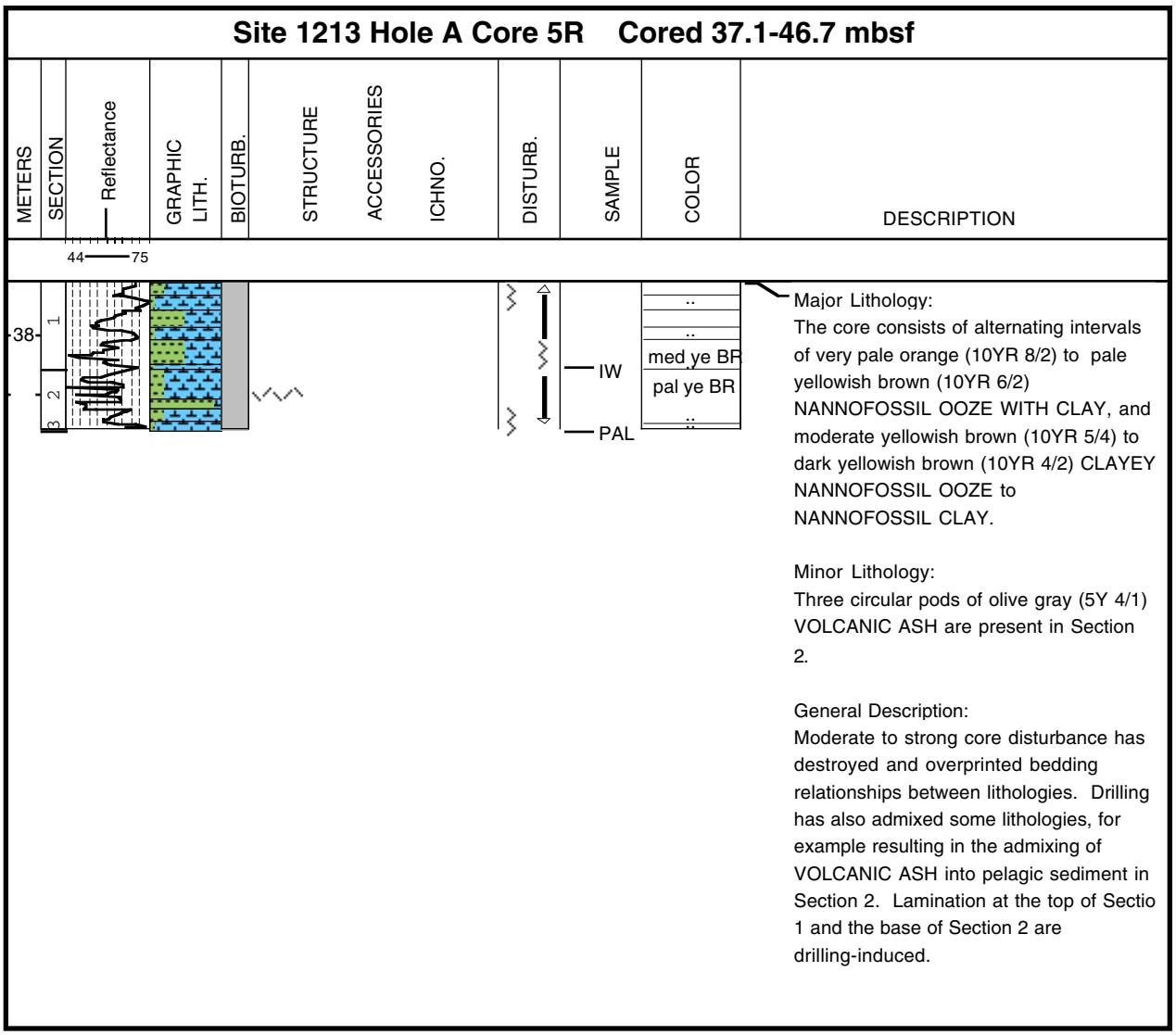

Site 1213 Hole A Core 3R Cored 18.1-27.5 mbsf
METERS
SECTION
Reflectance
47
74
GRAPHIC LITH.
BIOTURB.
STRUCTURE
ACCESSORIES
ICHNO.
DISTURB.
SAMPLE
COLOR
DESCRIPTION
20
22
24
26
1
2
3
4
5
6
7
CAR
SS
IW
PAL
lt ol GY
ye GY
ol GY
pal ye BR
Major Lithology:
Core 3R alternates between light olive gray (10YR 6/1, 5Y 5/2), olive gray (5Y 4/1) to moderate yellowish brown (10YR 5/4) CLAYEY NANNOFOSSIL OOZE and yellowish gray (5Y 7/2), pale yellowish brown (10YR 6/2) to very pale orange (10YR 8/2) NANNOFOSSIL OOZE WITH CLAY.
Minor Lithology:
In Section 4, 80-81 cm, a volcanic ASH layer is present.
General Description:
The core exhibits moderate drilling disturbance, deformation and stretching, throughout. Bioturbation is rare. An ash-filled burrow is present in Section 4, 63-66 cm. Contacts between different colors are predominantly irregular.

Core Photo


Site 1213 Hole A Core 4R Cored 27.5-37.1 mbsf
METERS
SECTION
Reflectance
30
74
GRAPHIC LITH.
BIOTURB.
STRUCTURE
ACCESSORIES
ICHNO.
DISTURB.
SAMPLE
COLOR
DESCRIPTION
28
1
2
3
SS
CAR
CAR
SS
ye GY
Major Lithology:
The core consists of yellowish gray (5Y 8/1), light olive gray (5Y 5/2) and olive gray (5Y 6/1) NANNOFOSSIL OOZE WITH CLAY.
Minor Lithology:
The core has minor components of grayish orange (10YR 7/4) and pale yellowish brown (10YR 6/2) NANNOFOSSIL OOZE WITH CLAY.
General Description:
The core is highly disturbed in Section 1, (to 23 cm and 60 to 150 cm.

Core Photo

Site 1213 Hole A Core 5R Cored 37.1-46.7 mbsf

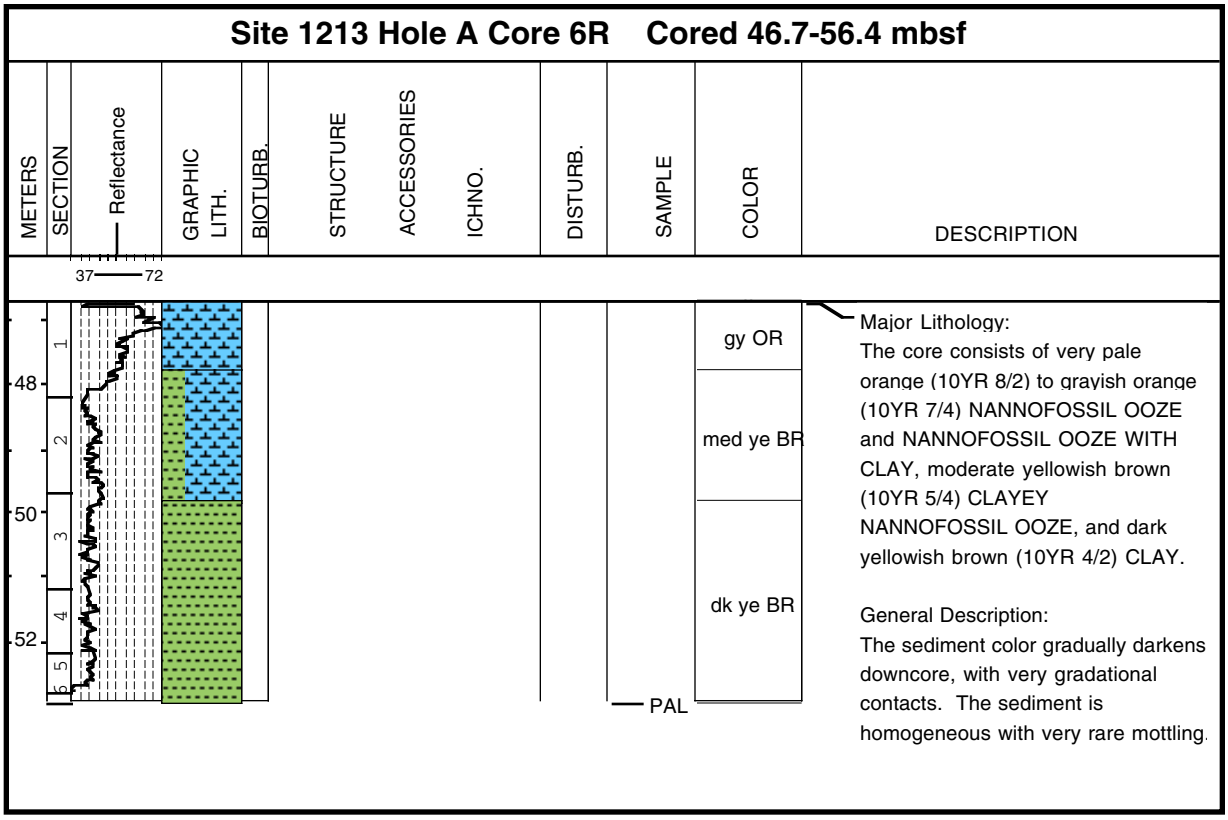


Major Lithology:
The core consists of alternating intervals of very pale orange (10YR 8/2) to pale yellowish brown (10YR 6/2) NANNOFOSSIL OOZE WITH CLAY, and moderate yellowish brown (10YR 5/4) to dark yellowish brown (10YR 4/2) CLAYEY NANNOFOSSIL OOZE to NANNOFOSSIL CLAY.

Minor Lithology:
Three circular pods of olive gray (5Y 4/1) VOLCANIC ASH are present in Section 2.

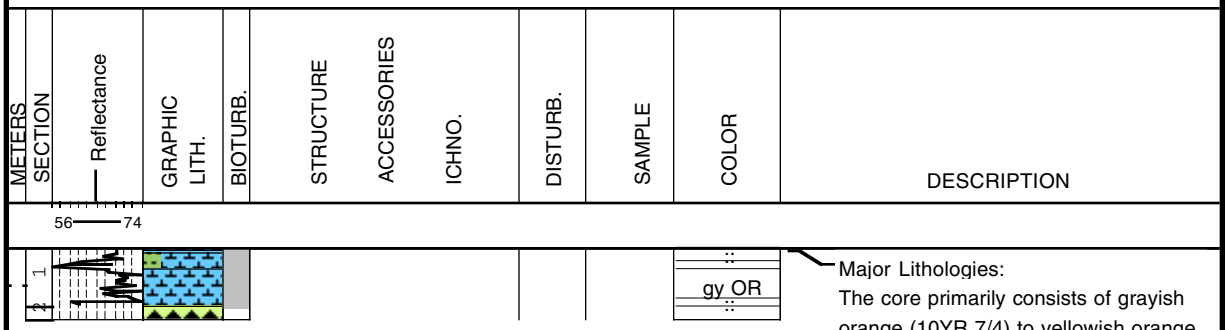
General Description:
Moderate to strong core disturbance has destroyed and overprinted bedding relationships between lithologies. Drilling has also admixed some lithologies, for example resulting in the admixing of VOLCANIC ASH into pelagic sediment in Section 2. Lamination at the top of Sectio 1 and the base of Section 2 are drilling-induced.

Core Photo


Site 1213 Hole A Core 6R Cored 46.7-56.4 mbsf
METERS
SECTION
Reflectance
GRAPHIC LITH.
BIOTURB.
STRUCTURE
ACCESSORIES
ICHNO.
DISTURB.
SAMPLE
COLOR
DESCRIPTION
37
72
48
50
52
1
2
3
4
5
6
PAL
gy OR
med ye BR
dk ye BR
Major Lithology:
The core consists of very pale orange (10YR 8/2) to grayish orange (10YR 7/4) NANNOFOSSIL OOZE and NANNOFOSSIL OOZE WITH CLAY, moderate yellowish brown (10YR 5/4) CLAYEY NANNOFOSSIL OOZE, and dark yellowish brown (10YR 4/2) CLAY.
General Description:
The sediment color gradually darkens downcore, with very gradational contacts. The sediment is homogeneous with very rare mottling.

Core Photo

Site 1213 Hole A Core 7R Cored 56.4-66.1 mbsf



Major Lithologies:
The core primarily consists of grayish orange (10YR 7/4) to yellowish orange (10YR 6/6) to very pale orange (10YR 8/2) NANNOFOSSIL OOZE, dark yellowish orange (10YR 6/6) to light brown (5YR 5/6) CLAYEY NANNOFOSSIL OOZE. The core-catcher consists of moderate brown (5YR 4/4) CHERT with streaks of dusky brown (5YR 2/2).

General Description:
The main portion of the core consists of very abbreviated (<10 cm) cycles with relatively sharp basal contacts between the underlying NANNOFOSSIL OOZE and overlying darker, CLAYEY NANNOFOSSIL OOZE which grades upward back into NANNOFOSSIL OOZE. The ooze is homogeneous with rare mottling evident at the contacts. The CHERT in the core catcher (3 pieces) have porcellanite coatings and inclusions.

Core Photo

Site 1213 Hole A Core 8R Cored 66.1-75.8 mbsf

METERS	SECTION	GRAPHIC LITH.	BIOTURB.	STRUCTURE	ACCESSORIES	ICHNO.	DISTURB.	SAMPLE	COLOR	DESCRIPTION
	1									

Major Lithology:
This core contains several fragments of CHERT which ranges in color from moderate yellowish brown (10YR 5/4) to moderate brown (5YR 3/4), light brown (5YR 5/6), and dark yellowish orange (10YR 6/6) and several fragments of nearly pure, very pale orange (10YR 8/2) PORCELLANITE.

General Description:
The chert is brecciated from the drilling process and has coatings and mm-scale inclusions of PORCELLANITE. The clasts of PORCELLANITE between 13 and 23 cm have a homogeneous texture.

Core Photo

Site 1213 Hole A Core 9R Cored 75.8-85.4 mbsf

METERS	SECTION	GRAPHIC LITH.	BIOTURB.	STRUCTURE	ACCESSORIES	ICHNO.	DISTURB.	SAMPLE	COLOR	DESCRIPTION
	1									Major Lithology: The lithology in this core is a mixture of pal yellowish brown (10YR 6/2) to dark yellowish brown (10YR 4/2) CHERT and very pale orange (10YR 8/2) PORCELLANITE. General Description: PORCELLANITE generally occurs as inclusions in the CHERT.

Core Photo

Site 1213 Hole A Core 10R Cored 85.4-95.0 mbsf

METERS	SECTION	GRAPHIC LITH.	BIOTURB.	STRUCTURE	ACCESSORIES	ICHNO.	DISTURB.	SAMPLE	COLOR	DESCRIPTION
										Major Lithology: The dominant lithology is medium dark gray (N4) CHERT. Minor Lithology: The CHERT contains inclusions and coatings of white (N9) to bluish white (5B 9/1) PORCELLANITE. General Description: The PORCELLANITE inclusions are mm- to cm-scale and are irregularly shaped.

Core Photo

Site 1213 Hole A Core 11R Cored 95.0-104.6 mbsf

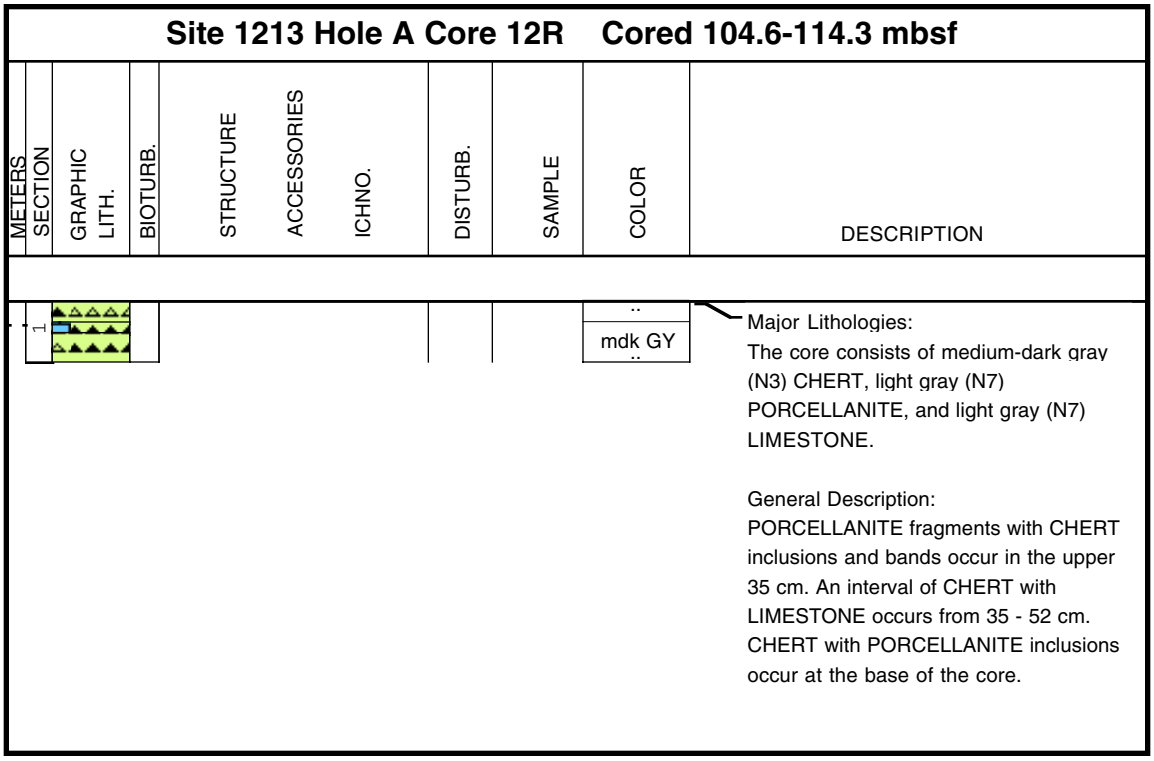
METERS	SECTION	GRAPHIC LITH.	BIOTURB.	STRUCTURE	ACCESSORIES	ICHNO.	DISTURB.	SAMPLE	COLOR	DESCRIPTION
	1									

Major Lithology:
The dominant lithology is medium dark gray (N4) CHERT.

Minor Lithology:
The CHERT contains inclusions and coatings of white (N9) to bluish white (5B 9/1) PORCELLANITE.

General Description:
The PORCELLANITE inclusions are mm- to cm-scale and are irregularly shaped.

Core Photo


Site 1213 Hole A Core 12R Cored 104.6-114.3 mbsf
METERS
SECTION
GRAPHIC LITH.
BIOTURB.
STRUCTURE
ACCESSORIES
ICHNO.
DISTURB.
SAMPLE
COLOR
DESCRIPTION
1
mdk GY
Major Lithologies:
The core consists of medium-dark gray (N3) CHERT, light gray (N7) PORCELLANITE, and light gray (N7) LIMESTONE.
General Description:
PORCELLANITE fragments with CHERT inclusions and bands occur in the upper 35 cm. An interval of CHERT with LIMESTONE occurs from 35 - 52 cm. CHERT with PORCELLANITE inclusions occur at the base of the core.

Core Photo

Site 1213 Hole A Core 13R Cored 114.3-123.9 mbsf

METERS	SECTION	GRAPHIC LITH.	BIOTURB.	STRUCTURE	ACCESSORIES	ICHNO.	DISTURB.	SAMPLE	COLOR	DESCRIPTION
	1									

Major Lithologies:
The core consists of medium-dark gray (N3) CHERT and light gray (N3) PORCELLANITE.

General Description:
The upper portion of the core contains fragments of PORCELLANITE with CHERT inclusions (0 to 30 cm), and from 30 to 64 cm, the core consists of CHERT with PORCELLANITE inclusions and coatings.

Core Photo

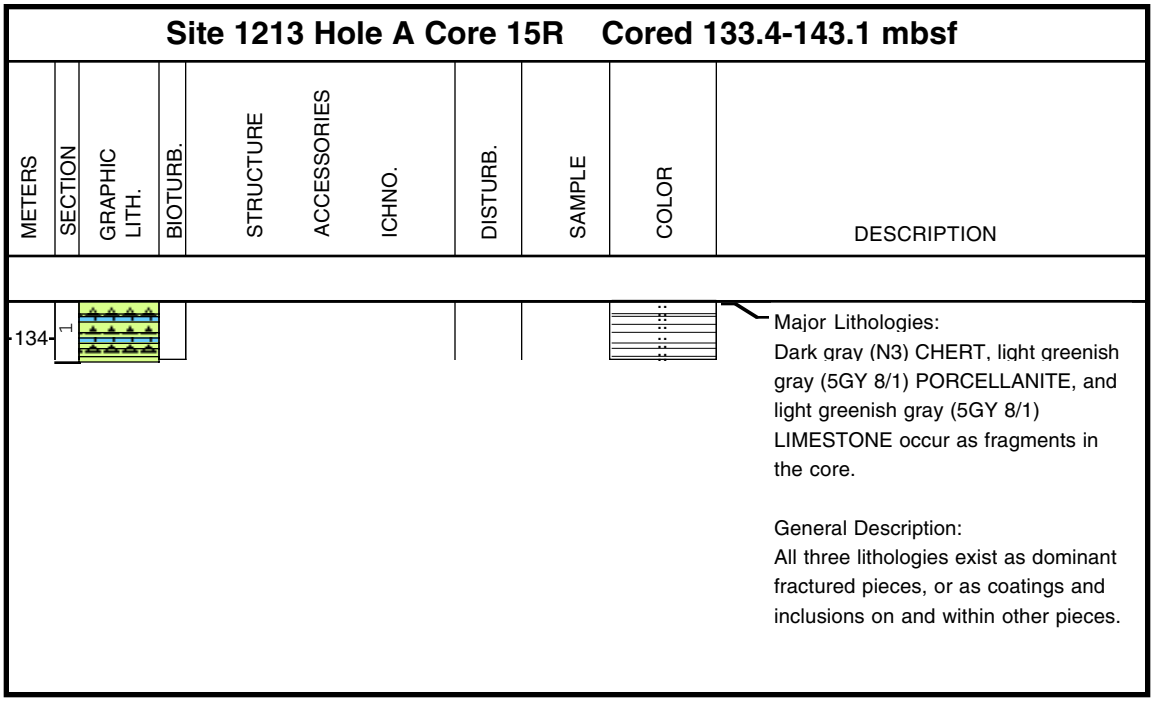
Site 1213 Hole A Core 14R Cored 123.9-133.4 mbsf

METERS	SECTION	GRAPHIC LITH.	BIOTURB.	STRUCTURE	ACCESSORIES	ICHNO.	DISTURB.	SAMPLE	COLOR	DESCRIPTION
	1								mdk GY	

Major Lithologies:
The core consists of fragmented medium dark gray (N4) to dusky yellowish brown (10YR 2/2) CHERT interbedded with light greenish gray (5GY 8/1) LIMESTONE.

General Description:
The fragments of CHERT and LIMESTONE are interbedded and often contain inclusions and coatings of the adjacent lithology.

Core Photo

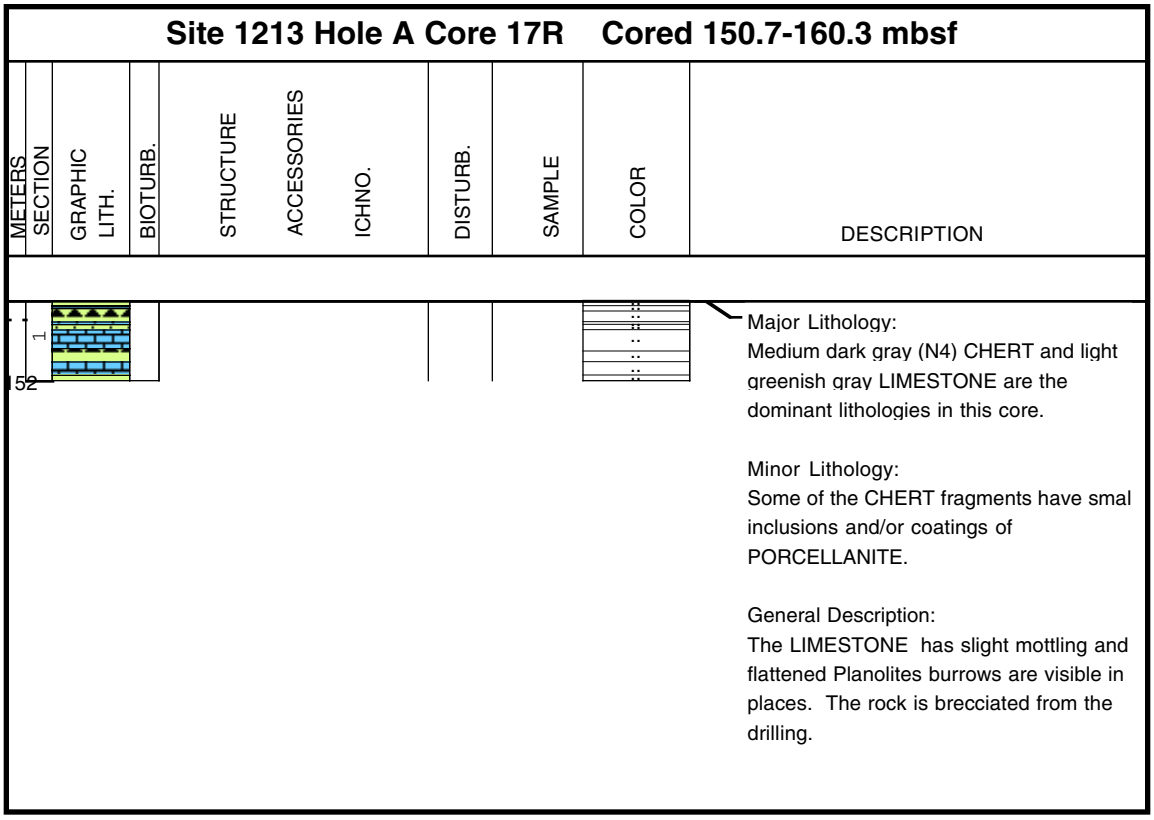

Site 1213 Hole A Core 15R Cored 133.4-143.1 mbsf
METERS
SECTION
GRAPHIC LITH.
BIOTURB.
STRUCTURE
ACCESSORIES
ICHNO.
DISTURB.
SAMPLE
COLOR
DESCRIPTION
134
1
Major Lithologies:
Dark gray (N3) CHERT, light greenish gray (5GY 8/1) PORCELLANITE, and light greenish gray (5GY 8/1) LIMESTONE occur as fragments in the core.
General Description:
All three lithologies exist as dominant fractured pieces, or as coatings and inclusions on and within other pieces.

Core Photo

Site 1213 Hole A Core 16R Cored 143.1-150.7 mbsf

METERS	SECTION	GRAPHIC LITH.	BIOTURB.	STRUCTURE	ACCESSORIES	ICHNO.	DISTURB.	SAMPLE	COLOR	DESCRIPTION
144	1							PAL		Major Lithology: Medium dark gray (N4) CHERT and light greenish gray (5G 8/1) LIMESTONE are the dominant lithologies in this core. Minor LIthology: PORCELLANITE occurs as rare inclusions and coatings on CHERT fragments. General Description: The rock in this core is brecciated from the drilling process. The LIMESTONE contains flattened Planolites burrows.

Core Photo


Site 1213 Hole A Core 17R Cored 150.7-160.3 mbsf
METERS
SECTION
GRAPHIC LITH.
BIOTURB.
STRUCTURE
ACCESSORIES
ICHNO.
DISTURB.
SAMPLE
COLOR
DESCRIPTION
1
152
Major Lithology:
Medium dark gray (N4) CHERT and light greenish gray LIMESTONE are the dominant lithologies in this core.
Minor Lithology:
Some of the CHERT fragments have smal inclusions and/or coatings of PORCELLANITE.
General Description:
The LIMESTONE has slight mottling and flattened Planolites burrows are visible in places. The rock is brecciated from the drilling.

Core Photo

Site 1213 Hole A Core 18R Cored 160.3-170.0 mbsf

METERS	SECTION	GRAPHIC LITH.	BIOTURB.	STRUCTURE	ACCESSORIES	ICHNO.	DISTURB.	SAMPLE	COLOR	DESCRIPTION
	1									

Major Lithology:
The core consists of fragments (up to 6 cm in diameter) of medium dark gray (N4) to dark gray (N3) to olive gray (5Y 4/1) to olive black (5Y 2/1) CHERT.

Minor Lithology:
White (N9) to light greenish gray (5G 8/1) burrow fills and partial coatings of the fragments are composed of PORCELLANITE.

General Description:
The only sedimentary structures are burrows and local concentrations of microfossils (radiolarians/foraminifers).

Core Photo

Site 1213 Hole A Core 19R Cored 170.0-179.6 mbsf

METERS	SECTION	GRAPHIC LITH.	BIOTURB.	STRUCTURE	ACCESSORIES	ICHNO.	DISTURB.	SAMPLE	COLOR	DESCRIPTION

Major Lithology:
The core consists of fragments (up to 5 cm in diameter) of olive black (5Y 2/1) to dark gray (N3) to olive gray (5Y 4/1) CHERT.

Minor Lithology:
The CHERT fragments have partial coatings and burrow fillings of light greenish gray (5GY 8/1) to white (N9) PORCELLANITE.

General Descriptions:
Sedimentary structures are limited to minor lamination and moderate bioturbation.

Core Photo

Site 1213 Hole A Core 20R Cored 179.6-189.3 mbsf

METERS	SECTION	GRAPHIC LITH.	BIOTURB.	STRUCTURE	ACCESSORIES	ICHNO.	DISTURB.	SAMPLE	COLOR	DESCRIPTION
180	1									

Major Lithology:
The core mainly consists of pieces and fragments of moderate brown (5YR 4/4) to light brown (5YR 3/4) to grayish brown (5YR 3/2) CHERT, with a few fragments of olive black (5Y 2/1) to olive gray (5Y 4/1) CHERT.

Minor Lithology:
PORCELLANITE fills burrows and partially coats the CHERT fragments. The PORCELLANITE color varies from yellowish gray (5Y 8/1) on brown fragments to white (N9) on the olive black/gray fragments.

General Description:
Burrows include Chondrites and concentrations of microfossils (radiolarians/foraminifers). One CHERT fragment exhibits laminar structures that might be flattened horizontal burrows or lamination.

Core Photo

Site 1213 Hole A Core 21R Cored 189.3-198.9 mbsf

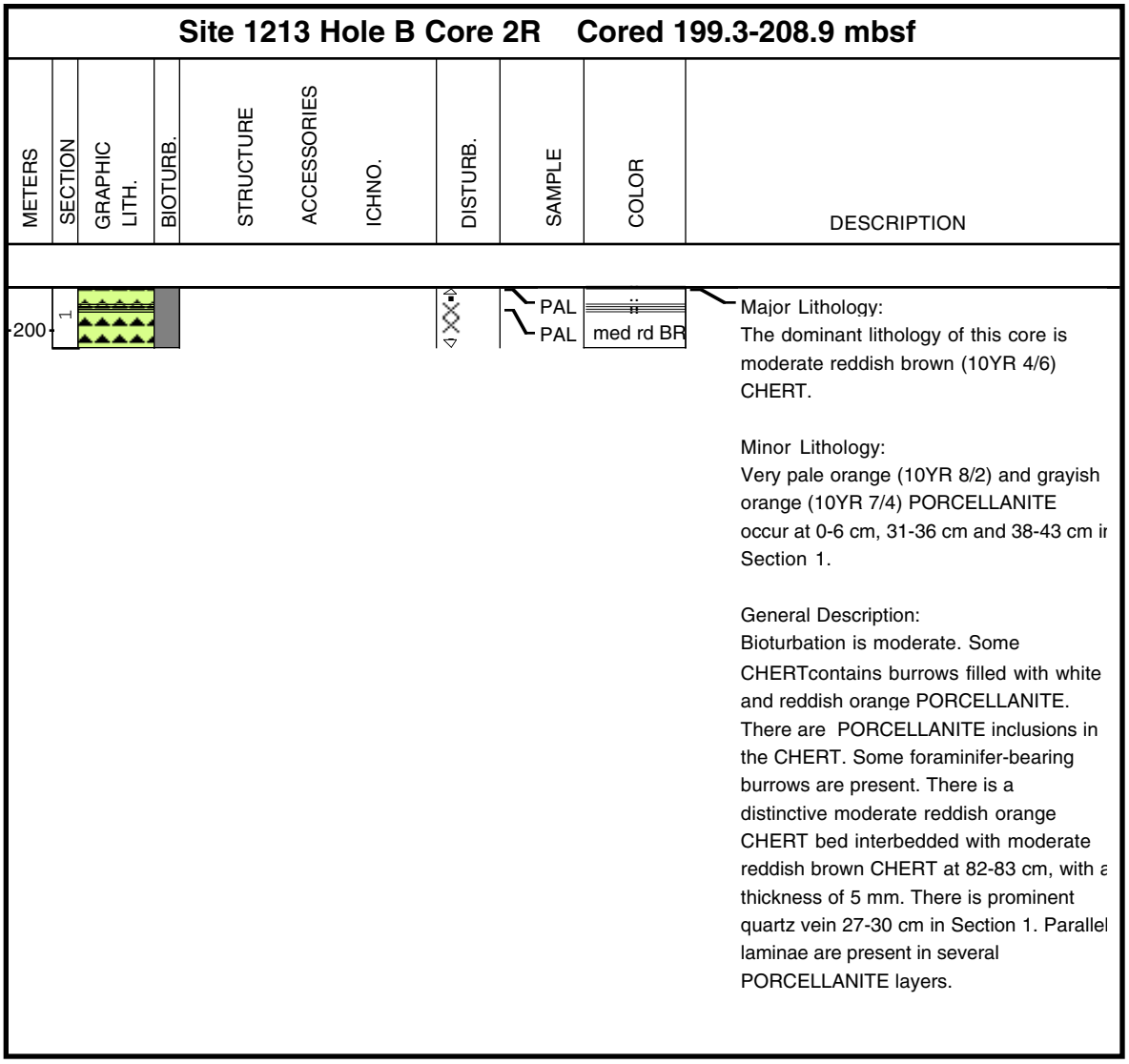
METERS	SECTION	GRAPHIC LITH.	BIOTURB.	STRUCTURE	ACCESSORIES	ICHNO.	DISTURB.	SAMPLE	COLOR	DESCRIPTION
	1							PAL		Major Lithology: The core consists of light brown (5YR 5/6) to moderate brown (5YR 3/4) CHERT with small inclusions and coatings of very pale orange (10YR 8/2) PORCELLANITE. General Description: The CHERT contains small, mm-scale to larger, cm-scale, amorphous shaped inclusions of PORCELLANITE. The PORCELLANITE is very homogenous in color and texture.

Core Photo

Site 1213 Hole B Core 1R Cored 189.7-199.3 mbsf

METERS	SECTION	GRAPHIC LITH.	BIOTURB.	STRUCTURE	ACCESSORIES	ICHNO.	DISTURB.	SAMPLE	COLOR	DESCRIPTION
190	1									Major Lithology: Primarily light brown (5YR 5/6) to moderate reddish brown (10R 4/6) CHERT Minor Lithology: Very pale orange (10YR 8/2) to pale yellowish brown (10YR 6/2) PORCELLANITE. General Description: This core contains individual pieces of CHERT, some up to 7 cm thick. Most of the CHERT is homogeneous in color but with some circular mottles of lighter and darker color. Small vugs in CHERT contain white (N9) to very pale orange (10YR 8/2) chalk or limestone. Healed fractures in present in some pieces, but are yellowish orange (10YR 6/6). The PORCELLANITE at 33 to 38 cm contains about 5 cm of foraminiferal limestone with wispy, irregular laminae consisting of fine sand-sized foraminifers. The finer-grained parts of this piece are chertified and one margin consists of moderate red-brown CHERT. At 45 to 50 cm, a massive piece of dark yellowish orange CHERT contains small lenses and wisps of foraminifers and inoceramid fragments (white).

Core Photo


Site 1213 Hole B Core 2R Cored 199.3-208.9 mbsf
METERS
SECTION
GRAPHIC LITH.
BIOTURB.
STRUCTURE
ACCESSORIES
ICHNO.
DISTURB.
SAMPLE
COLOR
DESCRIPTION
200
1
PAL
PAL
med rd BR
Major Lithology:
The dominant lithology of this core is moderate reddish brown (10YR 4/6) CHERT.
Minor Lithology:
Very pale orange (10YR 8/2) and grayish orange (10YR 7/4) PORCELLANITE occur at 0-6 cm, 31-36 cm and 38-43 cm i Section 1.
General Description:
Bioturbation is moderate. Some CHERTcontains burrows filled with white and reddish orange PORCELLANITE. There are PORCELLANITE inclusions in the CHERT. Some foraminifer-bearing burrows are present. There is a distinctive moderate reddish orange CHERT bed interbedded with moderate reddish brown CHERT at 82-83 cm, with a thickness of 5 mm. There is prominent quartz vein 27-30 cm in Section 1. Parallel laminae are present in several PORCELLANITE layers.

Core Photo

Site 1213 Hole B Core 3R Cored 208.9-218.6 mbsf

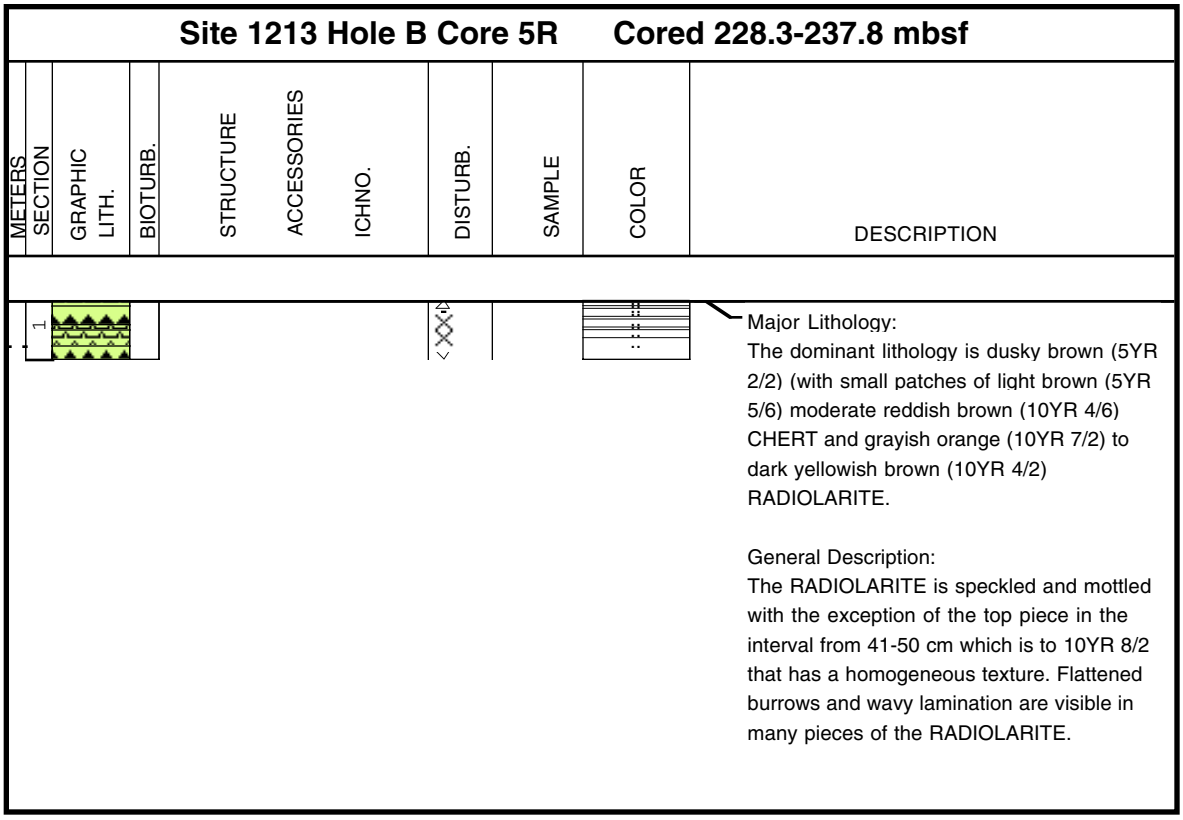
METERS	SECTION	GRAPHIC LITH.	BIOTURB.	STRUCTURE	ACCESSORIES	ICHNO.	DISTURB.	SAMPLE	COLOR	DESCRIPTION
	1							PAL	med rd BR	Major Lithology: The dominant Lithology is moderate reddish brown (10YR 4/6) CHERT. Minor Lithology: Grayish orange (10YR 7/4) PORCELLANITE is present as burrow fills, inclusions and layers throughout the CHERT. General Description: Bioturbation is moderate to common. A black quartz vein occurs at 52-55 cm in Section 1.

Core Photo

Site 1213 Hole B Core 4R Cored 218.6-228.3 mbsf

METERS	SECTION	GRAPHIC LITH.	BIOTURB.	STRUCTURE	ACCESSORIES	ICHNO.	DISTURB.	SAMPLE	COLOR	DESCRIPTION
220	1, 2							PAL		Major Lithology: Moderate reddish brown (10R 4/6) to very dusky red (10R 2/2) CHERT and moderate orange pink (5YR 8/4) to grayish orange (10YR 7/4) RADIOLARITE. General Description: The RADIOLARITE has a speckled and mottled texture and is banded with CHER in places. Flattened lens-shaped features in the RADIOLARITE may be compressed burrows. Some small-scale primary sedimentary structures (e.g. ripples, bedding) are visible in the RADIOLARITE. The CHERT has small (mm- to cm-scale) inclusions of RADIOLARITE; some of these inclusions are zoned with a lighter color of CHERT.

Core Photo

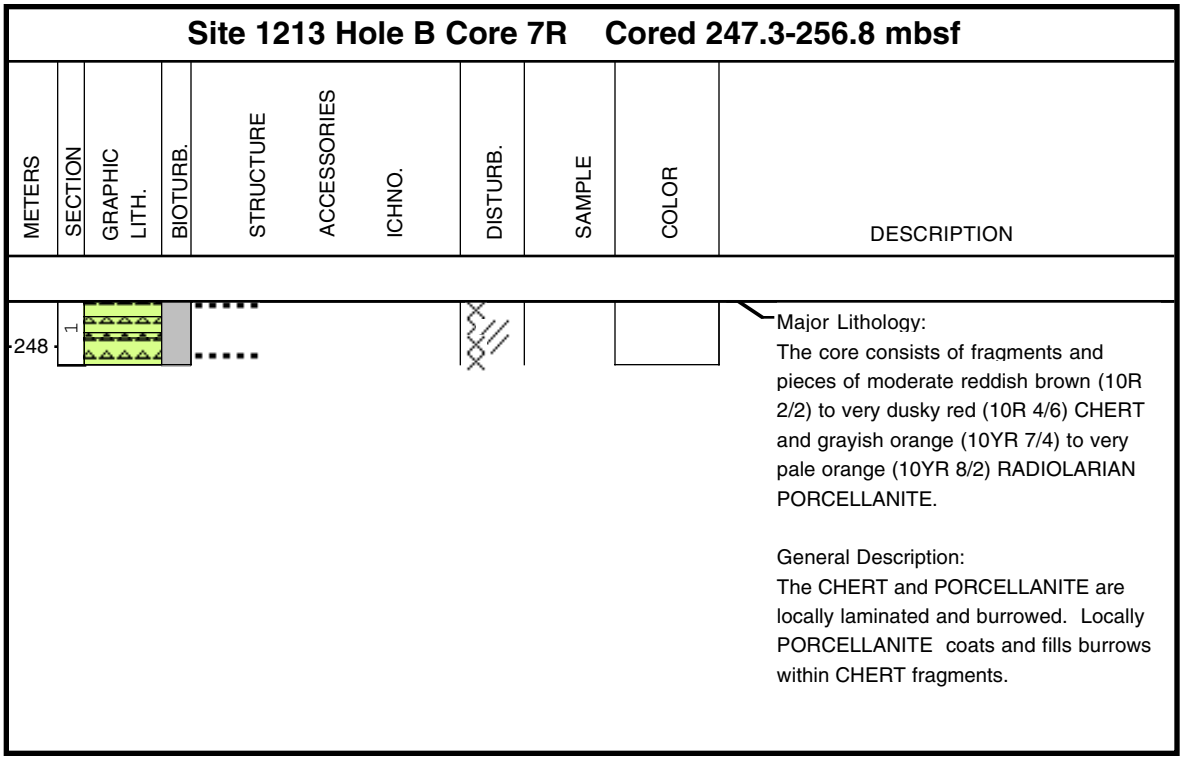

Site 1213 Hole B Core 5R Cored 228.3-237.8 mbsf
METERS
SECTION
GRAPHIC LITH.
BIOTURB.
STRUCTURE
ACCESSORIES
ICHNO.
DISTURB.
SAMPLE
COLOR
DESCRIPTION
1
Major Lithology:
The dominant lithology is dusky brown (5YR 2/2) (with small patches of light brown (5YR 5/6) moderate reddish brown (10YR 4/6) CHERT and grayish orange (10YR 7/2) to dark yellowish brown (10YR 4/2) RADIOLARITE.
General Description:
The RADIOLARITE is speckled and mottled with the exception of the top piece in the interval from 41-50 cm which is to 10YR 8/2 that has a homogeneous texture. Flattened burrows and wavy lamination are visible in many pieces of the RADIOLARITE.

Core Photo

Site 1213 Hole B Core 6R Cored 237.8-247.3 mbsf

METERS	SECTION	GRAPHIC LITH.	BIOTURB.	STRUCTURE	ACCESSORIES	ICHNO.	DISTURB.	SAMPLE	COLOR	DESCRIPTION
	1		Py					PAL PAL		Major Lithology: This core consists of grayish orange (10YR 7/4), very pale orange (10YR 8/2) to pale yellowish brown (10YR 6/2) PORCELLANITE, very pale orange (10YR 8/2) grayish orange (10YR 7/4) to pale yellowish brown (10YR 6/2) NANNOFOSSIL CHALK WITH RADIOLARIANS AND CLAY and moderate brown (5YR 3/4, 5YR 2/2) CHERT. Minor Lithology: Moderate yellowish brown (10YR 5/4) CLAYEY NANNOFOSSIL CHALK is present at 44-48 cm in Section 1. General Description: Bioturbation is common. Sedimentary structures such as laminae and ripples are present in both the PORCELLANITE and CHALK. Some CHERT occurs as nodules. Burrows fills are either CHERT, PORCELLANITE or CHALK.

Core Photo


Site 1213 Hole B Core 7R Cored 247.3-256.8 mbsf
METERS
SECTION
GRAPHIC LITH.
BIOTURB.
STRUCTURE
ACCESSORIES
ICHNO.
DISTURB.
SAMPLE
COLOR
DESCRIPTION
248
1
Major Lithology:
The core consists of fragments and pieces of moderate reddish brown (10R 2/2) to very dusky red (10R 4/6) CHERT and grayish orange (10YR 7/4) to very pale orange (10YR 8/2) RADIOLARIAN PORCELLANITE.
General Description:
The CHERT and PORCELLANITE are locally laminated and burrowed. Locally PORCELLANITE coats and fills burrows within CHERT fragments.

Core Photo

Site 1213 Hole B Core 8R Cored 256.8-266.4 mbsf

METERS	SECTION	GRAPHIC LITH.	BIOTURB.	STRUCTURE	ACCESSORIES	ICHNO.	DISTURB.	SAMPLE	COLOR	DESCRIPTION
248	1			Py				SS SS SS SS		Major Lithology: The core consists of grayish green (10G 4/4, 5G 5/2) to dusky green (5G 3/2) PORCELLANITE with local concentrations of radiolarians and olive black (5Y 2/1) to greenish black (5GY 2/1) ORGANIC CARBON-RICH CLAYEY PORCELLANITE. Minor Lithology: There is one fragment of grayish brown (5YR 3/2) CHERT with moderate orange pink (5YR 8/4) PORCELLANITE at 0-3 cm. A few fragments of recrystallized LIMESTONE(?), possibly an altered TUFF are present at 98-105 cm. General Description: The PORCELLANITE is finely laminated, burrowed, and locally wispy owing to compaction. The Corg-RICH PORCELLANITE occurs as thin beds and laminae with gradational (e.g., at 15 cm and 68 cm)to abrupt (e.g., at 93 cm) to bioturbated (e.g., at 97 cm) contacts with adjacent layers. A fracture in the Corg-RICH PORCELLANITE at 41-43 cm is filled with pyrite, as are several burrows.

Core Photo

Site 1213 Hole B Core 9R Cored 266.4-275.9 mbsf

METERS	SECTION	GRAPHIC LITH.	BIOTURB.	STRUCTURE	ACCESSORIES	ICHNO.	DISTURB.	SAMPLE	COLOR	DESCRIPTION
	1			Py				SS SS SS SS		Major Lithology: The core consists of three main lithologies: grayish green (10G 4/2) to greenish gray (5G 6/1) to light greenish gray (5G 8/1) to medium light gray (N6) PORCELLANITE; bluish white (5B 9/1) and light greenish gray (5G 8/1) NANNOFOSSIL CHALK; and CHERT, mainly moderate brown (5Y 3/4, 5YR 4/4), dark yellowish brown (10YR 4/2) in color with minor olive gray (5Y3/2) to dark greenish gray (5G 4/1) fragments. General Description: The foraminifera and radiolarian bearing CHERT fragments are coated with light gray (N7) to light greenish gray (5G 8/1) PORCELLANITE. Some burrows are filled with the same material. One fragment at 60-63 cm contains a silica-filled fracture.

Core Photo

Site 1213 Hole B Core 10R Cored 275.9-285.2 mbsf

METERS	SECTION	GRAPHIC LITH.	BIOTURB.	STRUCTURE	ACCESSORIES	ICHNO.	DISTURB.	SAMPLE	COLOR	DESCRIPTION
	1							SS		Major Lithology: The core consists of light greenish gray (5GY 8/1 to 5G 8/1) NANNOFOSSIL CHALK WITH RADIOLARIANS and olive gray (5Y 4/1) to olive black (5Y 2/1) to greenish gray (5GY 6/1) CHERT with coatings and burrow fills of yellowish gray (5Y 8/1) to white (N9) PORCELLANITE.

Core Photo

Site 1213 Hole B Core 11R Cored 285.2-294.8 mbsf

METERS	SECTION	GRAPHIC LITH.	BIOTURB.	STRUCTURE	ACCESSORIES	ICHNO.	DISTURB.	SAMPLE	COLOR	DESCRIPTION
	1							SS		Major Lithology: The core primarily consists of medium dark gray (N4) to medium gray (N5) CHERT with coatings and vug fill of white (N9) CHALK. Minor Lithology: One thin (4 cm) interval of soft NANNOFOSSIL CHALK WITH CLAY at the base of the core contains glauconite(?) and wispy flattened burrows, possibly Chondrites. General Description: Some burrows within the CHERT are filled by light olive gray (5Y 6/1) chalcedony and radiolarians.

Core Photo

Site 1213 Hole B Core 12R Cored 294.8-304.5 mbsf

METERS	SECTION	GRAPHIC LITH.	BIOTURB.	STRUCTURE	ACCESSORIES	ICHNO.	DISTURB.	SAMPLE	COLOR	DESCRIPTION
	1									Major Lithology: The core consists of fragments of dark gray (N4) to medium dark gray (N3) CHERT with bluish white (5B 9/1) to white (N9) PORCELLANITE coatings and irregular, light greenish gray (5Y 8/1) PORCELLANITE mottles or burrows that are rimmed by concentrations of radiolarians.

Core Photo

Site 1213 Hole B Core 13R Cored 304.5-314.1 mbsf

METERS	SECTION	GRAPHIC LITH.	BIOTURB.	STRUCTURE	ACCESSORIES	ICHNO.	DISTURB.	SAMPLE	COLOR	DESCRIPTION
										Major Lithology: The core consists of fragments of medium gray (N4) to medium dark gray (N5) to light olive gray (5Y 6/1) CHERT with rims and mottles (burrows outlined by concentrations of radiolarians) of yellowish gray (5Y 8/1) PORCELLANITE.

Core Photo

Site 1213 Hole B Core 14R Cored 314.1-323.8 mbsf

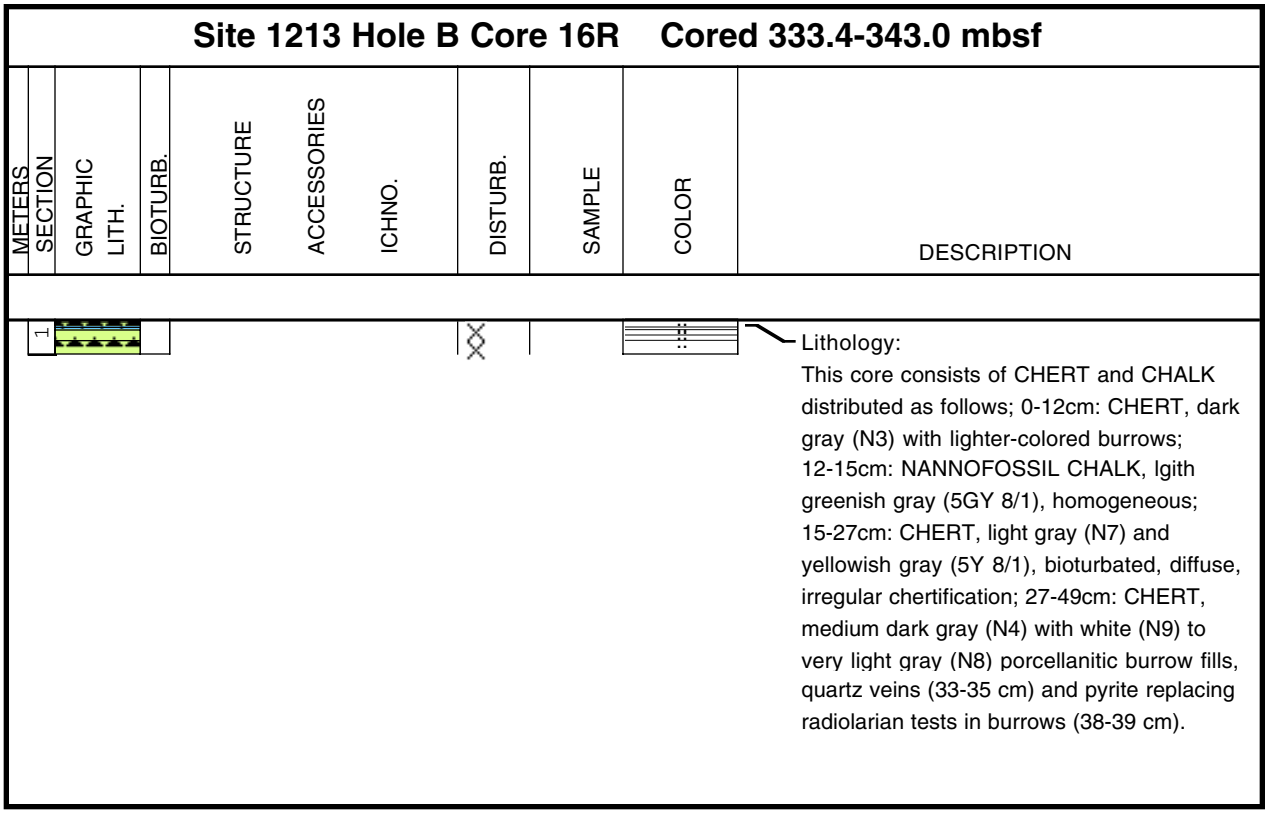
METERS SECTION	GRAPHIC LITH.	BIOTURB.	STRUCTURE	ACCESSORIES	ICHNO.	DISTURB.	SAMPLE	COLOR	DESCRIPTION
1							SS SS		Lithologies: This core consists of CHERT, CHALK, and CLAYEY CHALK as follows; 0-6cm: CHERT, medium dark gray to medium gray (N4-N5); 6-10cm: CLAYEY CHALK, yellow gray (5Y 7/2), homogeneous; 10-25cm: CHERT, mostly grayish black (N3-N4) and PORCELLANITE , light olive gray (5GY 6/1) to greenish gray (5Y 6/1); 25-46cm: CHALK, light greenish gray to yellow gray (5GY 8/1 tc 5Y 8/1), with streaks and wisps of darker material, probably flattened burrows. Composite burrows appear near the base of this piece, and solution seams at burrow margins occur near its top.; 46-50cm: CHERT, medium dark gray (N4) with a patina of yellowish gray porcellanitic chalk; 50-63cm: CHALK to CLAYEY CHALK, light greenish gray (5GY 8/1), with same features as in 25-46cm; 63-80cm: rubble of CLAYEY CHALK, yellowish gray (5Y 8/1) to light olive gray (5Y 6/1), fairly homogeneous with faint darker streaks; 80-110cm: CHERT, mostly shades of gray to grayish black (N2 to N7) with patinas of white (N8) porcellanite, and one piece of PORCELLANITE, greenish gray to light greenish gray (5GY 6/1). The dark cherts have irregular mottles and zones of light olive gray (5Y 6/1-8/1). Many of the lighter-colored burrows or bands have rinds or linings of white chalcedony.

Core Photo

Site 1213 Hole B Core 15R Cored 323.8-333.4 mbsf

METERS	SECTION	GRAPHIC LITH.	BIOTURB.	STRUCTURE	ACCESSORIES	ICHNO.	DISTURB.	SAMPLE	COLOR	DESCRIPTION
	1									Lithology: This core consists of CHERT, RADIOLARITE, and CHALK distributed as follows; 0-8cm: CHERT, burrowed, grading in color from olive gray (5Y 4/1) through medium light gray (N6) to very light gray (N8) at the top; 8-12cm: RADIOLARITE, light greenish gray (5GY 8/1) with dark clay seams; 12-21cm: CHERT, dark gray (N3) with adhering very light gray (N8) CHALK; 21-37cm: NANNOFOSSIL CHALK, very light green gray (5GY 9/1) with streaks and flattened burrows of light olive gray (5Y 6/1); 37-47: CHERT, irregular patches of light yellowish gray (5Y 8/1) and light gray (N7); 47-50: CHERT, medium dark gray (N4) with lighter mottles and spots; 50-55: CHERT, medium dark gray (N4) with diffuse lighter gray streaks and dark mottles which are likely flattened burrows; 55-58cm: CHERT, light gray (N7) with very light gray (N8) mottles and streaks; 58-63cm: CHERT, medium dark gray (N4) with very light gray bands (N8); 63-69cm: CHERT, medium dark gray (N4) to light gray (N7) irregular bands and blotches; 69-74cm: CHERT, brownish black (5YR 2/1) with light gray (N7) streaks and small mottles

Core Photo

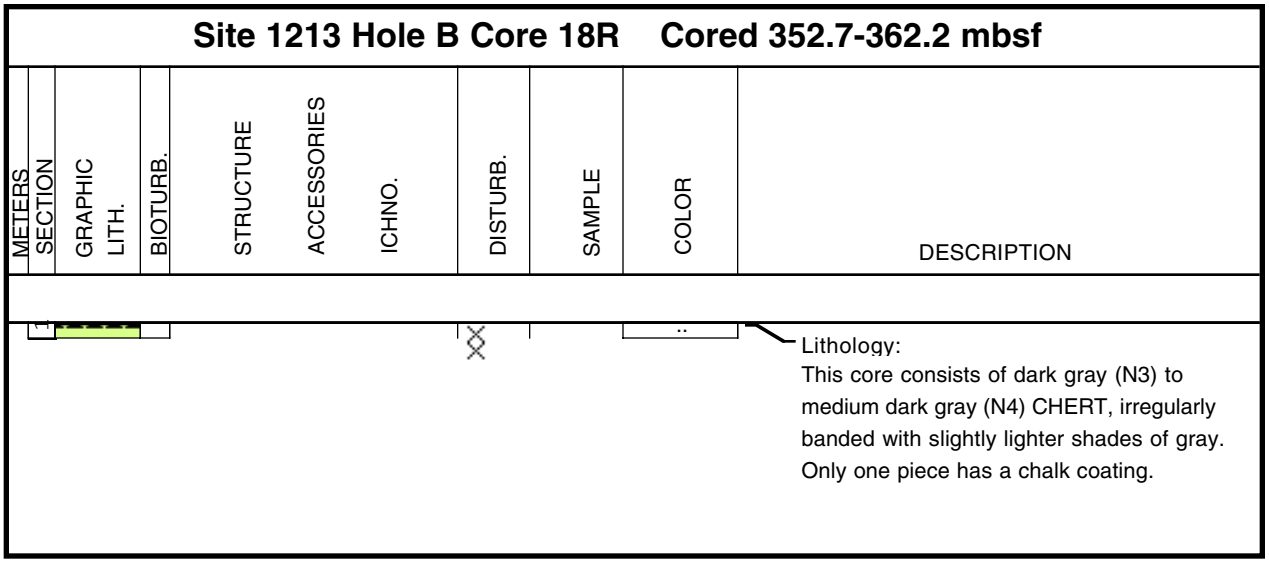

Site 1213 Hole B Core 16R Cored 333.4-343.0 mbsf
METERS
SECTION
GRAPHIC LITH.
BIOTURB.
STRUCTURE
ACCESSORIES
ICHNO.
DISTURB.
SAMPLE
COLOR
DESCRIPTION
1
Lithology:
This core consists of CHERT and CHALK distributed as follows; 0-12cm: CHERT, dark gray (N3) with lighter-colored burrows; 12-15cm: NANNOFOSSIL CHALK, lgith greenish gray (5GY 8/1), homogeneous; 15-27cm: CHERT, light gray (N7) and yellowish gray (5Y 8/1), bioturbated, diffuse, irregular chertification; 27-49cm: CHERT, medium dark gray (N4) with white (N9) to very light gray (N8) porcellanitic burrow fills, quartz veins (33-35 cm) and pyrite replacing radiolarian tests in burrows (38-39 cm).

Core Photo

Site 1213 Hole B Core 17R Cored 343.0-352.7 mbsf

METERS SECTION	GRAPHIC LITH.	BIOTURB.	STRUCTURE	ACCESSORIES	ICHNO.	DISTURB.	SAMPLE	COLOR	DESCRIPTION
1								mdk GY	Lithology: This core consists of medium dark gray (N4) to dark gray (N3) CHERT with irregular mottles of light gray (N7) and lighter-colored CHALK coatings and inclusions in vugs.

Core Photo


Site 1213 Hole B Core 18R Cored 352.7-362.2 mbsf
METERS
SECTION
GRAPHIC LITH.
BIOTURB.
STRUCTURE
ACCESSORIES
ICHNO.
DISTURB.
SAMPLE
COLOR
DESCRIPTION
1
Lithology:
This core consists of dark gray (N3) to medium dark gray (N4) CHERT, irregularly banded with slightly lighter shades of gray. Only one piece has a chalk coating.

Core Photo

Site 1213 Hole B Core 19R Cored 362.2-371.8 mbsf

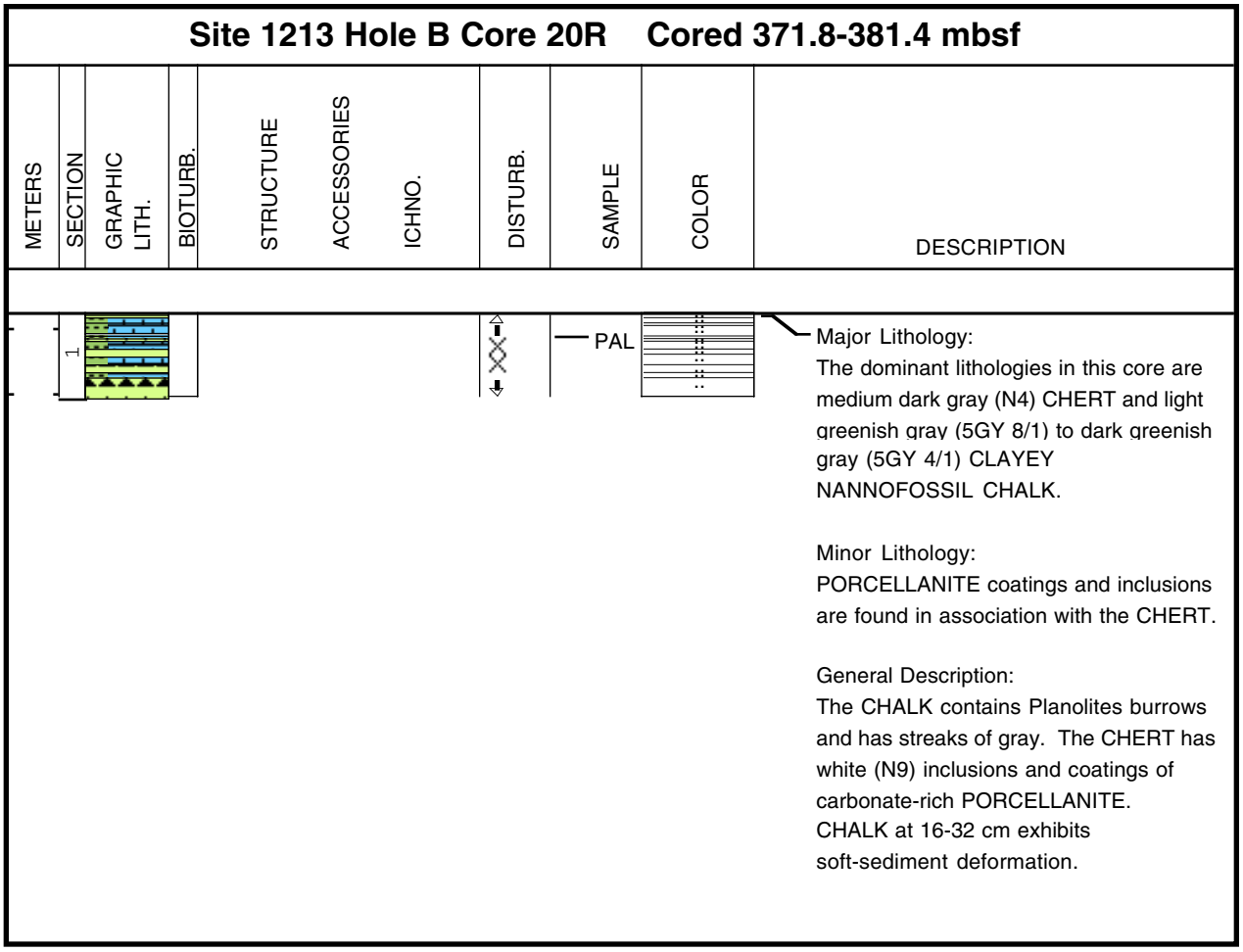
METERS	SECTION	GRAPHIC LITH.	BIOTURB.	STRUCTURE	ACCESSORIES	ICHNO.	DISTURB.	SAMPLE	COLOR	DESCRIPTION
	1							SS	mdk GY	

Major Lithology:
The dominant lithologies are light olive gray (5Y 6/1) to olive gray (5Y4/1) and light greenish gray (5GY 8/1) to greenish gray (5GY 6/1) CLAYEY NANNOFOSSIL CHALK and medium dark gray (N4) CHERT.

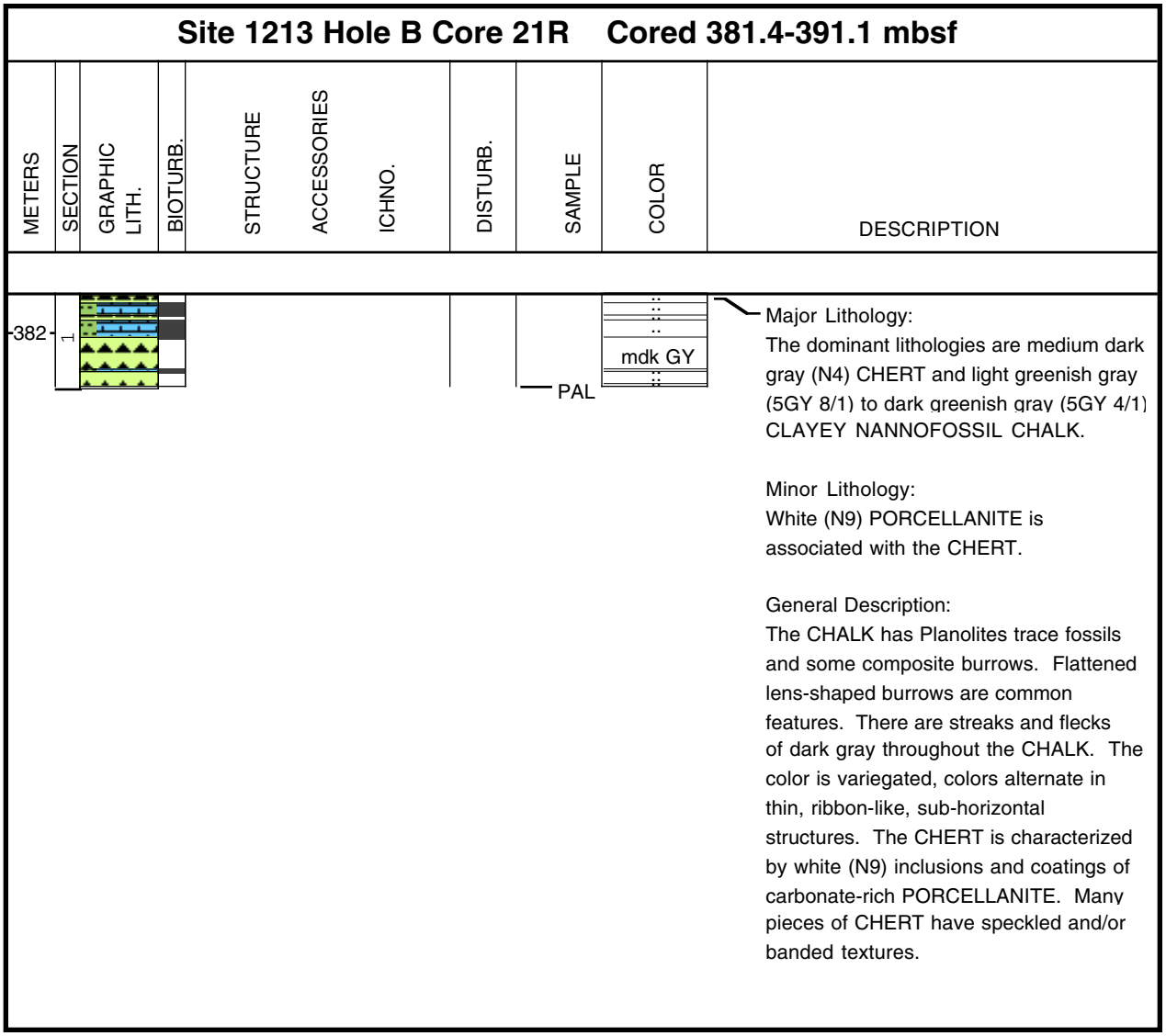
Minor Lithology:
An olive gray (5Y 3/2) CLAYSTONE occurs at the bottom of Section 1, between 112 and cm. White (N9) PORCELLANITE is associated with the CHERT.

General Description:
The CHALK has flattened, lens-shaped burrows (Palnolites) and contains streaks and flecks of dark gray (N3). A piece of CHALK between 108-111 cm contains flattened, nodules of CHERT. The CHERT has white (N9) carbonate-rich PORCELLANITE coatings and inclusions.

Core Photo


Site 1213 Hole B Core 20R Cored 371.8-381.4 mbsf
METERS
SECTION
GRAPHIC LITH.
BIOTURB.
STRUCTURE
ACCESSORIES
ICHNO.
DISTURB.
SAMPLE
COLOR
DESCRIPTION
1
PAL
Major Lithology:
The dominant lithologies in this core are medium dark gray (N4) CHERT and light greenish gray (5GY 8/1) to dark greenish gray (5GY 4/1) CLAYEY NANNOFOSSIL CHALK.
Minor Lithology:
PORCELLANITE coatings and inclusions are found in association with the CHERT.
General Description:
The CHALK contains Planolites burrows and has streaks of gray. The CHERT has white (N9) inclusions and coatings of carbonate-rich PORCELLANITE. CHALK at 16-32 cm exhibits soft-sediment deformation.

Core Photo


Site 1213 Hole B Core 21R Cored 381.4-391.1 mbsf
METERS
SECTION
GRAPHIC LITH.
BIOTURB.
STRUCTURE
ACCESSORIES
ICHNO.
DISTURB.
SAMPLE
COLOR
DESCRIPTION
382
1
PAL
mdk GY
Major Lithology:
The dominant lithologies are medium dark gray (N4) CHERT and light greenish gray (5GY 8/1) to dark greenish gray (5GY 4/1) CLAYEY NANNOFOSSIL CHALK.
Minor Lithology:
White (N9) PORCELLANITE is associated with the CHERT.
General Description:
The CHALK has Planolites trace fossils and some composite burrows. Flattened lens-shaped burrows are common features. There are streaks and flecks of dark gray throughout the CHALK. The color is variegated, colors alternate in thin, ribbon-like, sub-horizontal structures. The CHERT is characterized by white (N9) inclusions and coatings of carbonate-rich PORCELLANITE. Many pieces of CHERT have speckled and/or banded textures.

Core Photo

Site 1213 Hole B Core 22R Cored 391.1-400.7 mbsf

METERS	SECTION	GRAPHIC LITH.	BIOTURB.	STRUCTURE	ACCESSORIES	ICHNO.	DISTURB.	SAMPLE	COLOR	DESCRIPTION
392	1							SS CAR SS CAR	lt gn GY	Major Lithology: The core consists of olive black (5Y 2/1) to dark gray (N3) CHERT WITH RADIOLARIA exhibiting yellowish gray (5Y 8/1) PORCELLANITE coatings and bluishg white (5B 9/1) to light greenish gray (5G 8/1) NANNOFOSSIL CHALK WITH RADIOLARIANS that grades to light greenish gray (5G 8/1) NANNOFOSSIL CHALK WITH CLAY AND RADIOLARIANS to greenish gray (5G 6/1) CLAYEY NANNOFOSSIL CHALK. General Description: Chert color changes from olive black to dark gray and light olive gray downcore. The olive black CHERT has olive gray (5Y 4/1) burrow fills and mottles, and dark greenish gray (5G 4/1) laminae. The dark gray CHERT has medium gray (N5) mottles and burrow fills. Sparse radiolaria in the CHERT fragments are locally concentrated in burrows. The CHERT is primarily fragmentary, but there are several intact 10-cm long segments of NANNOFOSSIL CHALK to CLAYEY NANNOFOSSIL CHALK. These preserve several light/dark cycles where NANNOFOSSIL CHALK grades (no distinct bedding, overprinted by bioturbation?) into CLAYEY NANNOFOSSIL CHALK. Burrows within the NANNOFOSSIL CHALK are flattened and wispy.

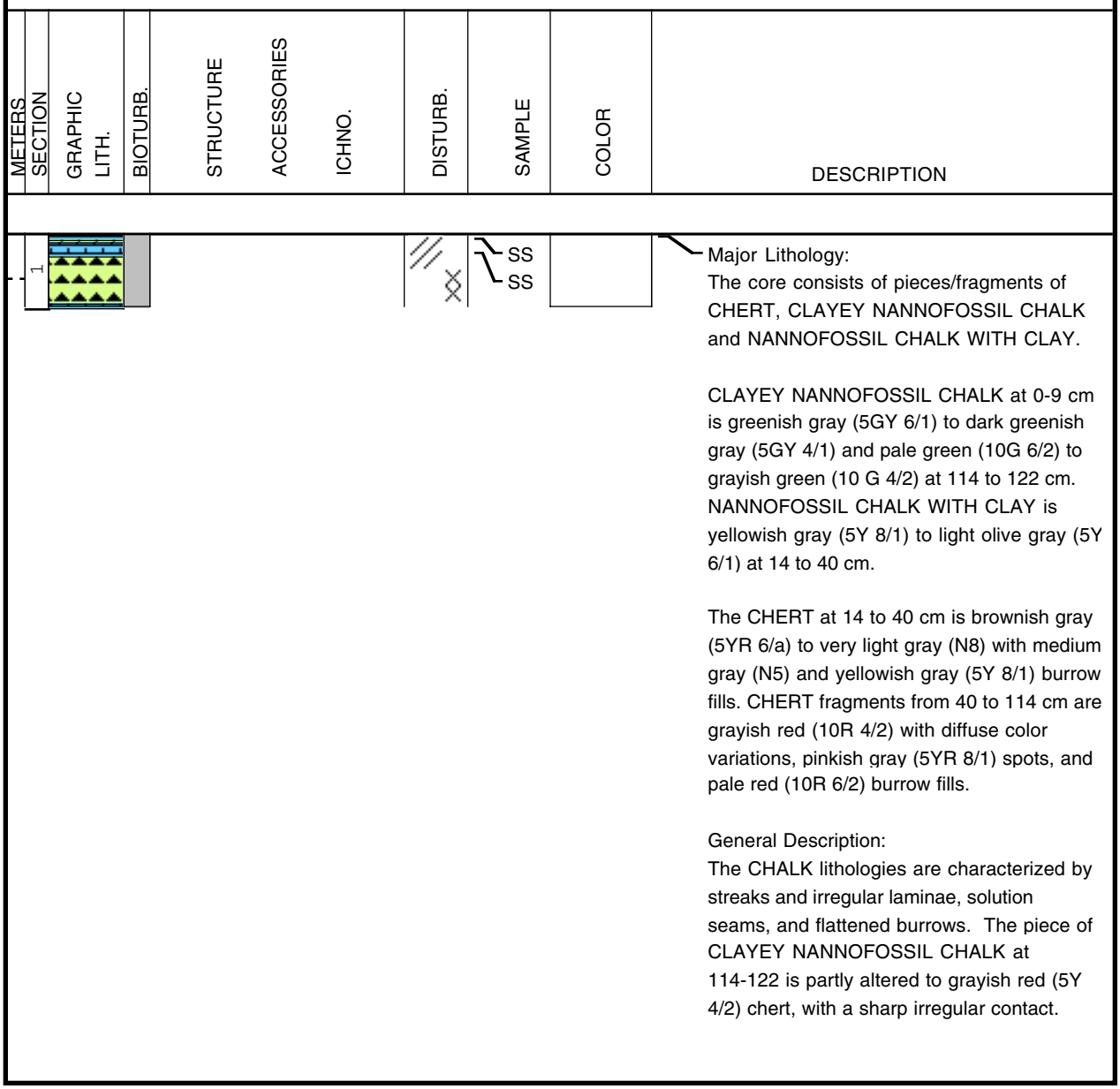
Core Photo

Site 1213 Hole B Core 23R Cored 400.7-410.3 mbsf

METERS	SECTION	GRAPHIC LITH.	BIOTURB.	STRUCTURE	ACCESSORIES	ICHNO.	DISTURB.	SAMPLE	COLOR	DESCRIPTION
402	1			Py					lt gn GY mlt GY	Major Lithology: The core consists of alternating CHERT and CHALK. The CHERT is mainly medium dark gray (N4) to medium gray (N5) with some brownish gray (5YR 4/1) and light olive gray (5Y 4/1) mottling and yellowish gray (5Y 8/1) coatings of PORCELLANITE. THE CHERT contains radiolarians and these are concentrated in burrows. The NANNOFOSSIL CHALK is light greenish gray (5G 8/1) and it gradually passes into greenish gray (5GY 6/1, 5G 6/1) NANNOFOSSIL CHALK WITH CLAY and into dark greenish gray (5G 4/1) CLAYEY NANNOFOSSIL CHALK. General Description: Burrows within the CHALK are flattened and wispy. At least one light/dark CHALK cycle is preserved in the core where the CHALK is more coherent.

Core Photo

Site 1213 Hole B Core 24R Cored 410.3-419.9 mbsf



Major Lithology:
The core consists of pieces/fragments of CHERT, CLAYEY NANNOFOSSIL CHALK and NANNOFOSSIL CHALK WITH CLAY.

CLAYEY NANNOFOSSIL CHALK at 0-9 cm is greenish gray (5GY 6/1) to dark greenish gray (5GY 4/1) and pale green (10G 6/2) to grayish green (10 G 4/2) at 114 to 122 cm. NANNOFOSSIL CHALK WITH CLAY is yellowish gray (5Y 8/1) to light olive gray (5Y 6/1) at 14 to 40 cm.

The CHERT at 14 to 40 cm is brownish gray (5YR 6/a) to very light gray (N8) with medium gray (N5) and yellowish gray (5Y 8/1) burrow fills. CHERT fragments from 40 to 114 cm are grayish red (10R 4/2) with diffuse color variations, pinkish gray (5YR 8/1) spots, and pale red (10R 6/2) burrow fills.

General Description:
The CHALK lithologies are characterized by streaks and irregular laminae, solution seams, and flattened burrows. The piece of CLAYEY NANNOFOSSIL CHALK at 114-122 is partly altered to grayish red (5Y 4/2) chert, with a sharp irregular contact.

Core Photo

Site 1213 Hole B Core 25R Cored 419.9-429.1 mbsf

METERS	SECTION	GRAPHIC LITH.	BIOTURB.	STRUCTURE	ACCESSORIES	ICHNO.	DISTURB.	SAMPLE	COLOR	DESCRIPTION
	1							SS		Major Lithology: The core consists of fragments of CHERT, NANNOFOSSIL CLAYSTONE, AND NANNOFOSSIL CHALK WITH CLAY AND RADIOLARIANS. CHERT fragments at 8 to 15 cm are moderate brown (5YR 6/4) with pale blue (5B 6/2) zones or dark yellowish brown (10YR 4/2) with spotty Fe-oxide alteration. The CHERT fragments at 28 to 77 cm are mostly pale brown (5YR 5/2) with light bluish gray (5B 7/1) bands and mottles, as well as, light pale orange PORCELLANITE inclusions. A few fragments are grayish red (10R 43/2) with pale red mottles, and one fragment at the base exhibits a grayish green (10GY 5/2) band. General Description: Radiolarians in the CHALK have been altered to carbonate.

Core Photo

Site 1213 Hole B Core 26R Cored 429.1-438.6 mbsf

METERS SECTION	GRAPHIC LITH.	BIOTURB.	STRUCTURE	ACCESSORIES	ICHNO.	DISTURB.	SAMPLE	COLOR	DESCRIPTION
1							SS SS		

Major Lithology:
The core consists of fragments and pieces of variegated CHERT WITH RADIOLARIANS. Brownish gray (5YR 4/1) to grayish brown (5YR 3/2) CHERT (Section 1, 0-12 cm) has dark greenish gray (5G 4/1) mottles and light greenish gray (5GY 8/1 to 5G 8/1) PORCELLANITE coatings and burrow fills. Chert fragments at 18-29 cm in Section 1 include dark greenish gray (5GY 4/1) CHERT WITH LIGHT GREENISH GRAY (5G 8/1) PORCELLANITE, dark gray (N3) fragment has moderate reddish brown (10R 4/6) burrows fills, and a moderate brown (5YR 4/4) CHERT framgent has light brown (5YR 6/4) PORCELLANITE coating. CHERT fragments from 34 to 70 cm in Section 1 exhibit colors ranging from red (10R 4/8) to dark yellowish orange (10YR 6/6) to moderate brown (5YR 3/4) to dark greenish gray (5 GY 4/1).

Minor lithology:
Pieces of light olive gray (5Y 6/1) NANNOFOSSIL CHALK WITH CLAY AND RADIOLARIANS are present in Section 1, 12-18 cm, and a fragment of moderate brown (5YR 4/4) NANNOFOSSIL CLAYSTONE WITH RADIOLARIANS is present at 29-33 cm in Seection 1.

General Description:
Radiolarians in the CHALK and NANNOFOSSIL CLAYSTONE are replaced by carbonate. CHERT fragments at 50 through 70 cm are crosscut by calcite-filled veins. The oxidation (red/gold color) of the chert appears to be secondary and can be seen to emanate from more porous burrow fills in otherwise unaltered fragments.

Core Photo

Site 1213 Hole B Core 27R Cored 438.6-447.8 mbsf

METERS	SECTION	GRAPHIC LITH.	BIOTURB.	STRUCTURE	ACCESSORIES	ICHNO.	DISTURB.	SAMPLE	COLOR	DESCRIPTION
	1							SS SS SS		

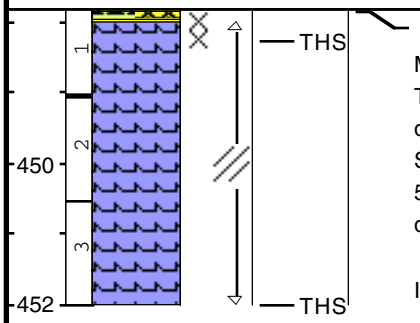
Major Lithology:
The dominant lithologies are moderate brown (5YR 4/4), dark yellowish orange (5YR 4/4), grayish green (10G 4/2), light brown (5YR 5/6) and dusky brown (5YR 7/2) CHERT and moderate brown (5YR 3/4), dark yellowish orange (10YR 6/6) CLAYSTONE.

Minor Lithology:
Pale brown (5YR 5/2) RADIOLARITE occurs at 3.2-20 cm, with a sharp contact to attached grayish brown (5YR 3/2) and grayish green (10G 4/2) CHERT nodule.

General Description:
3.5-20cm: CHERT, mostly moderate brown (5YR 4/4 to 3/4) and dark yellow orange (5YR 4/4 to 10 YR 6/6) gradations, streaks and lenses. Also pieces of grayish brown (5YR 3/2) to medium bluish gray (5B 5/1) CHERT. 20-23cm: CLAYSTONE, light brown with greenish gray reduction spot. 23-34cm: CLAYSTONE, moderate brown to pale brown (5YR 5/2), highly bioturbated, with healed, very thin fractures with greenish gray reduction spots (up to 2 cm wide) associated with fracture traces. 34-38cm: CHERT, moderate brown with light brown PORCELLANITE in burrows and as sediment on margins. 38-42: CHERT, light brown and dusky brown with PORCELLANITE and RED CLAYSTONE in burrows and isolated masses. 42-45cm: CHERT, moderate brown with some apparently unreplaced red CLAYSTONE in burrows. 45-49cm: CHERT, moderate brown with a few lighter brown spots. 49-60.5cm: CHERT, moderate yellowish brown (10YR 5/4), heavily burrowed, with irregular replacement of clayey radiolarian material. 60.5-102: LIMONITIC CLAYSTONE and LIMONITIC SILICIFIED CLAYSTONE BRECCIA, dark yellowish orange. This soft breccia (pieces 1 to 2 cm in diameter) is held together by an irregular stockwork of quartz veins < 1 mm wide, with coarser quartz crystals nearly filling vugs. The quartz is stained purplish gray, which may reflect manganese impurities. The veins have very thin reaction rims with the margins of host sediment clasts; thin zones of color changes from orange to red to green occur towards the veins.

Core Photo

Site 1213 Hole B Core 28R Cored 447.8-452.8 mbsf



Major Lithology:
The core consists of dark gray (N3) BASALT (Section 1, 17-23 cm), dark greenish gray (5GY 4/1) DIABASE (Section 1, 23-124 cm; Sections 2-3), and several pieces of yellowish brown (10YR 6/2; 10YI 5/4) to dark yellowish orange (10YR 6/6) altered CHERT and quartz-cemented BRECCIA (Section 1, 0-17 cm).

IGNEOUS ROCK DESCRIPTION:

Unit IVA: Basalt
Section 1, Piece 1
Contacts: None preserved
Phenocrysts: Sparsely to moderately phyric; plagioclase, pyroxene and olivine
Groundmass: Microcrystalline to glassy(?)
Vesicles: Some round to irregular amygdules
Structure: Chilled margin
Alteration: Fresh
Veins/Fractures: None

Unit IVA: Diabase
Section 1, Pieces 2, 3, and 4; Section 2, Pieces 1, 2, and 3; Section 3 Pieces 1, 2, and 3
Contacts: None preserved
Phenocrysts: Minor; 10% pyroxene
Groundmass: Fine-grained, microcrystalline plagioclase and pyroxene, and glass.
Vesicles: None
Structure: Massive
Alteration: Fresh except adjacent to thicker veins
Veins: Orientations range from subvertical (~50°) to horizontal; contain calcite, green clay minerals, and pyrite; range from 1mm to 5 mm in width; Occurrence: Section 1 (Pieces 2, 3B, 3C, 3D, 3E, 4(A-C)); Section 2 (Pieces 1(A-C), 2A, 2D/E, 3A, 3B
Fractures: Subhorizontal expansion(?) fractures at a spacing of 2mm in Section 1, gradually increasing from 3 mm to 2 cm down through Section 2; some drilling-induced fractures

Additional Comments:
Series of lithologies at top of core and continuing into base of previous core (Core 198-1213-27R) are thought to represent an intrusive baked contact between the sedimentary rocks of Unit III and BASALT/DIABASE of Unit IV.

Core Photo

Site 1213 Hole B Core 29R Cored 452.8-457.4 mbsf

METERS	SECTION	GRAPHIC LITH.	DISTURB.	SAMPLE	DESCRIPTION
	1				

Major Lithology:
The core consists of dark greenish gray (5GY 4/10 to medium dark gray (N4) DIABASE (Section 1, 13-70 cm) and several pieces of yellowish brown (10YR 5/4) to dark yellowish orange (10YR 6/1) altered CHERT and CHERT BRECCIA with vein quartz (Section 1, 0-13 cm). The latter are likely downhole cavings.

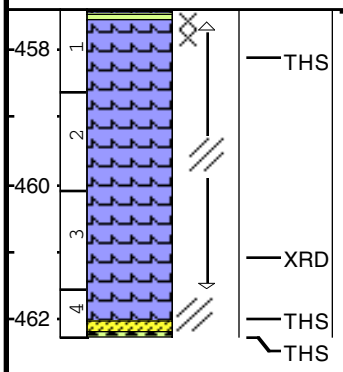
IGNEOUS ROCK DESCRIPTION:

Unit IVA: Diabase
Section 1, Pieces 2, 3, and 4
Contacts: Possible chilled (diabase/diabase) contacts at 29 (upper) and 51 (lower) cm
Phenocrysts: Aphyric
Groundmass: Fine-grained, microcrystalline plagioclase
Vesicles: Along chilled contacts; filled with green clay minerals; 0.5-1.5 mm in diameter
Structure: Massive
Alteration: None
Veins: Orientations mostly subvertical, but range to subhorizontal; contain calcite, quartz, and green clay minerals; range from 0.5 to 1.5 mm in width; Occurrence: Section 1, Pieces 2, 3, and 4
Fractures: Some drilling-induced fractures

Additional Comments: The chilled margins within the diabase suggests that there were multiple injection events. Veins cross-cut these chilled margins.

Core Photo

Site 1213 Hole B Core 30R Cored 457.4-467.0 mbsf



DESCRIPTION

Major Lithology:
The core consists of dark greenish gray (5GY 4/1 to 5G 4/1) to medium gray (N5) to medium dark gray (N4) DIABASE (Section 1, 0-1 cm and 17-123cm; Sections 2-3; Section 4, 0-48 cm), medium gray (N5) to medium dark gray (N4) BASALT (Section 4, 48-65 cm) and two pieces of altered CHERT (Section 1, 11-17 cm; Section 4, 65-74 cm). Fragments from 0-17 cm in Section 1 are "rollers" of uncertain origin. CHERT fragment at 65-74 cm in Section 4 is silicified medium bluish gray (5B 5/1) to light bluish gray (5B 7/1) burrowed sediment w reddish oxidation.

IGNEOUS ROCK DESCRIPTION:

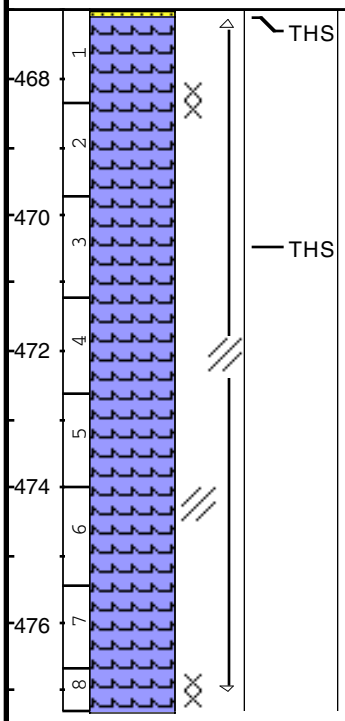
Unit IVA: Diabase
Section 1, Pieces 1, 2, 4, and 5; Section 2, Pieces 1, and 2; Section 3 Pieces 1, 2, and 3; Section 4, Pieces 1 through 4
Contacts: None
Phenocrysts: Minor in sections 3 and 4
Groundmass: Microcrystalline; plagioclase, pyroxene, olivine(?)
Vesicles: None in Sections 1 through 3, but some in Section 4
Structure: Massive
Alteration: Some alteration (<1-2 mm) at vein margins
Veins: Orientations are generally subvertical; range in color from dark grayish green (5G 2/1) to greenish black (5GY 2/1) to white (N8) contain calcite, green clay minerals; range from 0.3-0.7 cm in width;
Occurrence: Section 1, Pieces 4A, 4D; Section 2, Piece 2E; Section 3, Pieces 2B, 2C; Section 4, Pieces 1 and 3
Fracures: Some drilling-induced fractures

Unit IVA: Basalt
Section 4, Pieces 5-7
Contacts: Gradational with diabase
Phenocrysts: Aphyric to sparsely phyric: Few pyroxene and amphibole
Groundmass: Aphanitic to microcrystalline
Vesicles: Lined and filled with microcrystalline material; <1mm in diameter
Structure: Chilled margin
Alteration: None
Veins/Fractures: None

Additional Comments:
Altered sedimentary rock (Piece 8 in Section 4) is considered the boundary between two intrusive subunits (A,B) of Unit IV. Diabase becomes darker and vesicle content increase downcore towards this boundary. The vein in Piece 1B in Section 4 exhibits slickensides.

Core Photo

Site 1213 Hole B Core 31R Cored 467.0-476.6 mbsf



DESCRIPTION

Major Lithology:
The core consists of medium dark gray (N4) BASALT (Section 1, 0-1 cm) and dark gray (N5) DIABASE (Section 1, 11-134 cm; Sections 2-8). Color of the DIABASE changes from dark gray (N5) in Section 1 to dark greenish gray (5GY 4/1) in Sections 2 through 8.

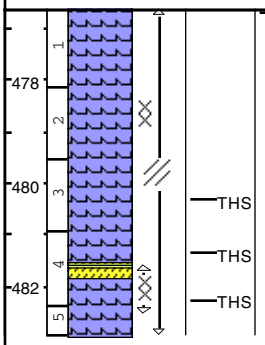
IGNEOUS ROCK DESCRIPTION:

Unit IVB: Basalt
Section 1, Pieces 1 and 2, and top of Piece 3
Contacts: Gradational with diabase
Phenocrysts: Sparsely phyric; plagioclase and pyroxene
Groundmass: Microcrystalline to glassy(?)
Vesicles: Few round to irregular; calcite filled
Structure: Chilled margin
Alteration: Minor pyrite?
Veins/Fractures: None

Unit IVB: Diabase
Section 1, Piece 3; Section 2, Pieces 1, and 2; Section 3, Piece 1; Section 4. Pieces 1, 2, and 3; Section 5, Piece 1; Section 6, Pieces 1 and 2; Section 7, Pieces, 1, 2, and 3; Section 8, Pieces 1 through 5
Contacts: Gradational with basalt
Phenocrysts: None to minor plagioclase; some small (0.2-0.5 cm) glomeroporphyritic clusters of crystals, locally rounded in shape (xenoliths?), in Sections 1 and 2
Groundmass: Fine-grained, to microcrystalline; plagioclase, pyroxene, olivine(?), minor to no glass(?)
Vesicles: None
Structure: Massive
Alteration: Some alteration near veins
Veins/Fractures: Occurrence: Section 1, Pieces 3A and 3E (1-3 mm in width; filled by calcite); Section 2, Pieces 1 and 2 (one long vertical vein 5-6 mm in width lined by green clay minerals (chlorite?) and filled by calcite); Section 3, Pieces 1A, 1D, and 1E (1-8 mm thick; filled with calcite and green clay mineral (chlorite?)); Section 4, Pieces 1A, 2A through 2D, and 3A (mainly calcite-filled, some with pyrite and black clay minerals(?)); Section 5, Piece 1A (calcite, dark black clay minerals(?), pyrite); Section 6, Pieces 1B, 1C, 2A (calcite, pyrite); Section 7, Pieces 1(1-3 cm, calcite and green clay minerals) and 3B (1 mm, green clay minerals); and Section 8, Pieces 1 and 3 (2 cm altere zone with calcite, pyrite and green clay minerals)

Core Photo

Site 1213 Hole B Core 32R Cored 476.6-485.7 mbsf



Major Lithology:
The core consists of dark gray (N3) to dark greenish gray (5GY 4/1) DIABASE (Sections 1, 2, 3, and 4, 0-62cm and 23-124 cm, and Section 5), medium dark gray (N4) BASALT (Section 4, 63-70 cm and 76-94 cm), and one piece of altered grayish black (N2) to brownish black (5YR 2/1) CHERT (Section 4, 70-76 cm).

IGNEOUS ROCK DESCRIPTION:
Unit IVB: Diabase
Section 1, Pieces 1 and 2; Section 2, Pieces 1, 2, and 3; Section 3, Pieces 1 through 8; Section 4, Pieces 1, 2A and 2B (to 63cm)
Contacts: Diabase/Basalt contact at base (~63 cm) of Section 4, Piece 2A; Phenocrysts: Rare olivine and pyroxene; Groundmass: Fine-grained to microcrystalline plagioclase, pyroxene, rare olivine; a few glomerophorphyritic clusters of plagioclase and pyroxene crystals, locally rounded in shape (xenoliths?) up to 1 cm in diameter (Sections 1, 132 cm; Section 2, 34-38 cm; Section 3, 8-13 cm, 44 cm, 59 cm); Vesicles: None; Structure: Massive; Alteration: None except adjacent to veins; Veins: Section 1, Piece 1B (0.1-0.5 mm; subhorizontal, filled with green clay minerals and pyrite); Section 2, Pieces 1D (~2 mm, calcite), 2A (drilling rubble of vein and alteration material?; calcite, pyrite, dark clay minerals), 3C (0.5 cm; calcite), and 3E-3F (series of veins up to 1.5 cm thick; dominantly filled with dark green clay(?) minerals, some calcite and pyrite, and possible epidote); Fractures: Subhorizontal (expansion?) fractures in Section 4 are spaced at 1cm in Piece 1, decreasing to a spacing of 1 mm in Piece 2A towards the chilled margin

Unit IVB: Basalt
Section 4, Pieces 2B(basal 2 cm) and 3
Contacts: gradational with adjacent diabase; Phenocrysts: Aphyric to sparsely phyric, plagioclase; Groundmass: Microcrystalline to glassy; Vesicles: None; Structure: Chilled margin; Alteration: Fresh; Veins/Fractures: None

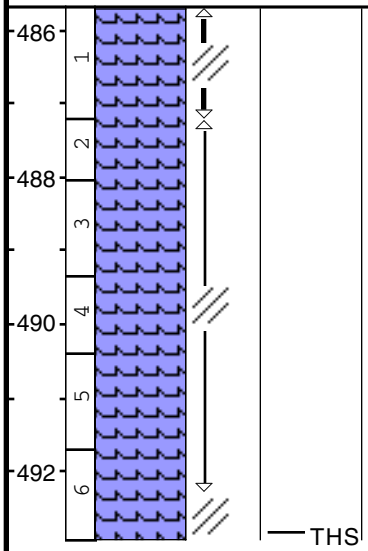
Unit IVC: Basalt
Section 4, Piece 5, 6
Contacts: None preserved; Phenocrysts: Aphyric to sparsely phyric; few plagioclase; Groundmass: Microcrystalline to glassy; Vesicles: Several (~5 mm diameter) in Piece 6 of Section 4, filled by green clay(?) minerals and calcite; Structure: Chilled margin; Alteration: None; Veins/Fractures: None

Unit IVC: Diabase
Section 4, Pieces 7, 8, and 9; Section 5, Pieces 1 through 5
Contacts: None; Phenocrysts: ; Groundmass: Common glomerophorphyritic clusters of crystals, locally rounded in shape (xenoliths?) up to 1 cm in diameter (Sections 4, 98-140 cm); Vesicles: Some irregular to round vesicles in Piece 1 of Section 3; these range from 0.1-0.5 cm in diameter, are irregular to rounded in shape and are filled by pyrite and other microcrystalline minerals; they are surrounded by phyric (plagioclase) basalt ; Structure: Massive; Alteration: ; Veins/Fractures: Occurrence: Section 4, Pieces 8, 9 and Section 5, Pieces 2 and 5 (subvertical to horizontal; 1 cm and less in diameter; filled by calcite and/or green clay(?) minerals, pyrite and some epidote(?)); thick vein in Piece 5 of Section 5 is offset by small clay-filled veins

Additional Comments: Several pieces (Section 1, Pieces 1C and 1D; Section 5, Piece 3) were polished on a glass plate to view the textures; these have a slightly darker appearance. The altered sediment (CHERT?) at 44-48 cm in Section 4 (Piece 4) is considered the contact between two intrusive subunits, IVB and IVC.

Core Photo

Site 1213 Hole B Core 33R Cored 485.7-494.4 mbsf



DESCRIPTION

Major Lithology:
The core consists of dark greenish gray (5GY 4/1) DIABASE. Color of the DIABASE is slightly darker in Sections 1, 2, and 6.

IGNEOUS ROCK DESCRIPTION:

Unit IVC: Diabase
Sections 1 through 6
Contacts: None
Phenocrysts: None; some small (0.2-0.5 cm) glomeroporphyritic clusters of crystals (plagioclase and pyroxene) up to 1 cm in diameter locally rounded in shape (xenoliths?), in Sections 1 (Piece 12a only), 2 (Pieces 1 and 2 only), 3, 4, and 5
Groundmass: Fine-grained, to microcrystalline; plagioclase, pyroxene, olivine(?), minor to no glass(?)
Vesicles: None
Structure: Massive
Alteration: None, except perhaps near veins
Veins: Filled by dark green clay, calcite, or both; clay-filled veins best developed in Sections 1 (up to 1 cm wide; some slickensides), 2 (0.1-0.5 cm wide; Interval from 10-85 cm highly cross-cut by clay-filled veins), and base of Section 6 (1-3 mm wide), whereas carbonate veins dominate in Section 4 (large 0.5-2.0 cm-wide; vuggy and brecciated); in Sections 3 and 5 they are less developed; veins cover up to 10 of the core surface in Sections 1, 2, and 6, and less than 1% in Sections 3 and 5
Fractures: Induced by drilling and localized along veins

Smear Slides

Sample						Size			Mineral																Biogenic																						Rock				
Core	Core Type	Section	Top (cm)	Depth (mbsf)	Lithology	Sand	Silt	Clay	Apatite	Barite	Calcite	Carbonate	Chalcedony	Chert	Clay Mineral	Detrital Carbonate	Dolomite	Fe Oxide	Feldspar	Glauconite	Inorganic Calcite	Mica	Muscovite	Opaques	Organic Calcite	Oxides	Phillipsite	Plagioclase	Pyrite	Quartz	Volcanic Glass	Zeolite	Calcispheres	Diatoms	Dinoflagellate	Fish Remains	Foraminifers	Mollusk	Nannofossils	Pollen	Radiolarians	Silicoflagellates	Sponge Spicules	Bioclasts	Organic Debris	Cement	Fecal Pellet	Organic Debris	Organic Matter	Rock Fragment
Hole A																																																		
1	R	1	71	0.71	D										35				*		3				5				2	*				7			1		44		3		*						
1	R	3	120	4.2	D										25				2		4				5				3	2				15			*		38		5	1							
1	R	5	90	6.9	D										30				*		3				5									6			1		45		10	*	*						
2	R	1	45	8.85	M						3				30	*			1			*								*	35			5			1		22		1	2	*						
2	R	1	130	9.7	M						3				47			1				*		*						*	*		*				3		45						*				
2	R	2	10	10	M						1				35							*								*	*			2			10		51			1			*				
2	R	3	69	12.09	D										41			1			2	*		*						*			*	2			2		50		1	1							
3	R	1	97	19.07	D										30			1			5									1	1			3					53		5		1						
3	R	3	116	22.26	D										20						5													5					62		7	1							
3	R	5	57	24.67	D										15						5													5					70		5								
4	R	1	107	28.57	D										15						3													2					78		2								
4	R	2	20	29.2	D										15						5			1							1			3			5		66		3		1						
5	R	1	36	37.46	D										10																			1			2		86		1								
5	R	2	30	38.9	D						1				20				*			1								*	45			3			1		25		3								
5	R	2	60	39.2	D						15				57	1		1	1			*		2							10			5			*		5		2								
6	R	1	23	46.93	M											2		*	5												92								1									*	
6	R	1	32	47.02	D										5						2				1									*			1		88		2	1	*						
6	R	1	90	47.6	D										10				*						3				2	*	*						1		83		1	*	*						
6	R	5	50	52.7	D										92				2		3				1					1	1												*						
7	R	1	23	56.63	M										25				*		30				1				*										44										
7	R	1	34	56.74	M										65				*											*		30							5										
7	R	1	52	56.92	D						8				2				*											2	2								86										
Hole B																																																		
8	R	1	64	257.44	D					2			30		28									5																					35			
8	R	1	16	256.96	M								100																																					
8	R	1	101	257.81	D								85								15																												
8	R	1	108	257.88	M																100																					*							
9	R	1	12	266.52	D								80																										20										
9	R	1	35	266.75	M								50		30																								20										
9	R	1	53	266.93	D							45																										55										
9	R	1	70	267.1	D							60																										40										
10	R	1	10	276	D										8									*													1		76		15								
11	R	1	61	285.81	M										15									2													1		82										
14	R	1	67	314.77	D										20			1																			2		77										
14	R	1	58	314.68	D										20			1																			1		78										
19	R	1	7	362.27	D										25			*																				75										
22	R	1	24	391.34	D										5										*														85		10								
22	R	1	66	391.76	D										5						*								5										45		45								
22	R	1	111	392.21	D							*			40			*											5										55		*				*				
24	R	1	26	410.56	D							5			17																								73		5								
24	R	1	4	410.34	D										22																								75		3								
25	R	1	19	420.09	M							3			15																								64		18								
26	R	1	31	429.41	M							10			45			5																					40										
26	R	1	15	429.25	M							18			16																								66										
27	R	1	27	438.87	D										40			30												30																		
27	R	1	69	439.29	D										45			45												10																		
27	R	1	93	439.53	M							5			40			4				1																50										

Thin Sections

Sedimentary Thin Sections

Sample Interval	Name	Structures	Comments	Mineral Components (Authigenic, Detrital, and Volcanic)									Biogenic Components					
				Carbonate	Clay	Opaque Minerals	Intraclasts	Fe-Mn Oxides	Carbonate Cement	Quartz in	Chalcedony &/or Quartz Cement	Opal Cement	Fish Remains	Foraminifers	Nannofossils	Radiolarians	Ostracodes	Total
Hole A																		
1213A-8R-CC, 13-15 cm	Chalk/ Porcellanite with Radiolarians										5	3 (may be clay?)	tr	1 (silicified)	80 (+ clay?)	10 (some still opal)	1	100
1213A-8R-CC, 21-25 cm	Nannofossil Porcellanite with Radiolarians	Thin vein filled by carbonate			tr (infilling radiolarians)						3	5		tr	82	10		100
1213A-12R-1, 15-18 cm	Partly Silicified Nannofossil Chalk with Radiolarians										7		1	2	75 (+ clay?)	15		100
1213A-13R-1, 21-24 cm	Partly Silicified Nannofossil Chalk with Radiolarians										7		tr	10	73	10 (some spicules)		100
1213A-15R-1, 6-8 cm	Partly Silicified Nannofossil Chalk with Radiolarians	Wispy texture	Intraclasts may be compacted clay infillings of dissolved radiolarians	tr			2 (clay?)					3 (clay minerals?)	tr	1	79	15		100
Hole B																		
1213B-4R-1, 5-9 cm	Partly Silicified Nannofossil Chalk with Radiolarians	Thin vein filled by chalcedony	Some radiolarians still opaline						tr		10			1	69	20 (some spicules)		100
1213B-4R-1, 25-28 cm	Partly Silicified Nannofossil Chalk with Radiolarians										15		tr	tr	65	20		100
1213B-4R-2, 0-3 cm	Partly Silicified Nannofossil Chalk with Radiolarians	Burrows with radiolarian concentrations Lamination (clay/carbonate rich)	Fe-bearing material encased in quartz cement in radiolarians Series of chalcedony-filled veins			2 (oxidized pyrite?)					10	2		1	75	10		100
1213B-22R-1, 2-4 cm	Porcellanite or Partly Silicified and Recrystallized Nannofossil Chalk with Radiolarians	Meshwork of fractures Lamination	Thin carbonate-filled veins Lepispheres replaced by quartz			2 (pyrite replacement of radiolarains)			30 (replacement and vein fill)	40	13 (some coarser microcrystalline quartz)			tr?	replaced by silica	15		100
1213B-27R-1, 74-76 cm	Limonitic Breccia with Quartz Cement	Microbial networks (Fe-oxide strands)	Fe-oxide strands encased in quartz cement					50 Limonitic clasts			50 (chalcedony followed by macroscopic quartz)							

Igneous Thin Sections

Sample Interval	Subunit	Name	Texture	Groundmass Plagioclase			Groundmass Pyroxene			Groundmass Olivine			Ground-mass Opaques		Groundmass Glass		Phenocrysts		Veins	Vesicles	Glomerophenocrysts
				Percentage	Size	Alteration	Percentage	Size	Alteration	Percentage	Size	Alteration	Percentage	Size	Percentage	Alteration	Type	Alteration			
Hole B																					
1213B-28R-1, 45-48 cm	IVA	Diabase	Intersertal to Intergranular to Glomeroporphyritic	45	0.76 mm max. 0.29 mm ave.	to smectite along fractures (minor)	7	0.11 mm ave.		8	<0.67 mm		10	0.05 mm ave.	30	devitrified alt. to smectite alt. to carbonate	None		Carbonate & green clay filled	None	Some
1213B-28R-3, 143-145 cm	IVA	Diabase	Subophytic to Intersertal	40	1.6 mm max. 0.6 mm ave.		20	0.2 mm ave.		10	0.5 mm ave.	(some inclu-sions)	10	0.19 mm ave.	20	devitrified some fine plagioclase microlites	None		None	Amygdules or crystals altered to carbonate	None
1213B-30R-2, 27-30 cm	IVA	Diabase	Intergranular to Intersertal to Subophytic	45	1.8 mm max. 0.5 mm ave.	to smectite along fractures (minor)	20	<0.57 mm (wide range)		5	<0.8 mm (wide range)	(some inclu-sions)	10	0.10 mm ave.	30	slightly devitrified (dark brown)			Brown clay filled	? Plucked?	
1213B-30R-4, 39-41 cm	IVA	Diabase (Basalt?)	Intersertal to Intergranular	45	1.6 mm max. 0.38 mm ave.	to smectite along fractures (minor)	27	<0.6 mm	to smectite (relict cleavage?)	3	<0.6 mm	to smec-tite?	5	0.08 mm ave.	20	Altered to clay and devitrified (dark brown)	None		None	None	None
1213B-31R-1, 7-10 cm	IVB	Basalt	Seriate to slightly Glomeroporphyritic	20	1.5 mm max. 0.29 mm ave. some swallow tail crystals	to smectite (moderate)	2	0.38 ave.	to smectite (relict cleavage?)	3	<0.67 mm	(some inclu-sions)	5		70	devitrified/ altered Fibrous bundles of microlites	Plagio-clase		Smectite filled	>1 mm dark patches (?) Amygdules filled with smectite	Some
1213B-31R-3, 73-75 cm	IVB	Diabase	Subophytic	48	1.5 mm max. 0.67 mm ave.	to smectite along fractures (minor)	2	0.66 mm ave.	to clay + carbonate(?)	30	0.66 mm ave.		10	0.11 mm ave.	5	devitrified/ altered			Carbonate, smectite, and quartz filled	None	large (1.2 mm) composed of plagioclase crystals 2 mm and less+ pyroene +opaques
1213B-32R-3, 72-75 cm	IVB	Diabase	Subophytic to Intergranular	50	1.4 mm max. 0.82 mm ave. (some spherulites)	to smectite along fractures	10	0.5 mm max. 0.29 mm ave		2	0.5 mm max. 0.29 mm ave		5	0.17 mm ave. (some skeletal)	20	devitrified/ altered	None		None	None	None
							15	pyroxene and olivine altered to smectite													
1213B-33R-6, 106-108 cm	IVC	Diabase	Intergranular (Subophytic? prior to alteration)	45	0.5 mm max.	to smectite along cleavage & fractures (moderate)	5	remnants-		?			5	0.06 mm ave. (some skeletal)	5	altered to clay minerals	Plagio-clase (6.0-1.0 mm) Severley altered to Smec-tite and Albite(?)		Carbonate & smectite filled	None	
				(5% large phenocrysts)	0.34 mm ave. (some spherulites)		35	pyroxene and oliv-ine(?) altered to smectite													

Metamorphic Thin Sections										
Sample Interval	**Subunit**	**Texture**	**Sericite**	**Volcanic Glass**	**Groundmass quartz and in Burrows**	**Phosphatic Debris**	**Microfossils**	**Fe Oxides**	**Dirty Carbonate**	**Fibrous Metamorphic Mineral**
Hole B										
1213B-30R-4, 66-69 cm	IVA / IVB	Meta-silicified shale (phyllite) with volcanic ash	55	10	30	trace	ghosts of radiolarians and foraminifers(?)	5		
1213B-32R-4, 71-74 cm	IVB / IVC	Metachert			80		ghosts of radiolarians and foraminifers(?)	10	5	5