

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color
0.0-0.7		1	Maastrichtian			T T T T T	
0.7-1.0		2				T	

DESCRIPTION

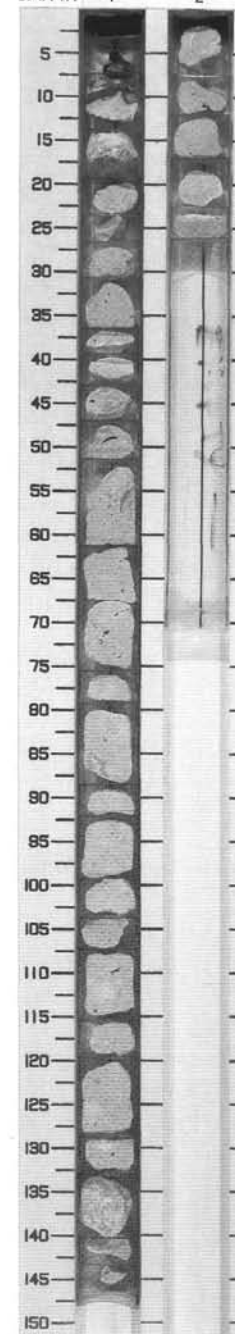
MANGANESE CRUST and ALGAL-RUDIST GRAINSTONE AND RUDSTONE

Major Lithologies:

Section 1, 0–7 cm, consists of two fragments of MANGANESE CRUST, black (2.5YR N2.5/0). In the second fragment (Section 1, 3–7 cm), the manganese crust is developed over a light gray (10YR 7/2) limestone; the contact between the manganese crust and the limestone is irregular. Scattered black specks of manganese occur in the limestone. Section 1, 7–14 cm, exhibits two contacts: the upper contact (at Section 1, 10 cm) is between a MANGANESE-COATED LIMESTONE CONGLOMERATE and an underlying MANGANESE CRUST; the second contact is between the base of the MANGANESE CRUST and an underlying, well-cemented FORAMINIFER-RUDIST GRAINSTONE. The MANGANESE-COATED LIMESTONE CONGLOMERATE is made up of clasts of pelagic limestones with planktonic foraminifers, yellow (10YR 7/6) to very pale brown (10YR 7/3). The outer edges of the clasts are stained in red (2.5YR 5/8) to reddish-yellow (5YR 7/8); these clasts are partly replaced by manganese. These clasts support manganese stromatolites which grow in every direction. Multiple infillings, of very pale brown (10YR 8/3) pelagic sediments with planktonic foraminifers are observed in the limestone conglomerate. The MANGANESE CRUST exhibits spectacular digitate stromatolitic accretions that enclose pores filled with white (10YR 8/2) to yellow (10YR 7/6) pelagic carbonate sediments. It includes multiple generations of stacked digitate and laminated stromatolites. The manganese is clearly replacive and cuts grains of the pelagic infillings (especially planktonic foraminifers); multiple generations of pelagic infillings are recorded. Thin red to yellow coatings (probably phosphate) occur at the top of Mn dendrites (last coating). Clasts of rudist grainstone (2–3 cm in size) are embedded in the manganese crust, with thin manganese dendrites extending inward. The MANGANESE CRUST overlies a FORAMINIFER-RUDIST GRAINSTONE with well-cemented fragments. The foraminifers especially include orbitoids; rudist fragments are caprinids. Other components are red algal fragments (corallinaceans). The

upper surface of the grainstone seems to be "recrystallized", with irregular cavities (1 mm to several mm in size) rimmed by calcite cement crusts (long blades); the cavities are filled by yellow (10YR 7/6) sediments, rich in planktonic foraminifers. The upper surface of the grainstone is very irregular (scalloped); it is red stained (2.5YR 5/8) with thin-laminated to bulbous coatings that grade upwards into the black manganese crust. The upper surface of the grainstone may enclose manganese dendrites and probable cyanobacterial threads; these threads cut the upper surface such that, the manganese seems to be clearly replacive. Section 1, 14–19 cm, RUDIST RUDSTONE. This rudstone includes large fragments of caprinids. The internal cavities of the rudists are cemented by white to very pale brown (10YR 7/4) calcitic crusts (PB5C), 1 mm to 2–3 mm thick; they are infilled with very pale brown (10YR 8/3) internal geopetal sediment. Fragments of red algae and encrustations of red algae occur in the "matrix". The rest of this core, including: Section 1, 19–148 cm and Section 2, 0–26 cm is primarily comprised of ALGAL RUDIST GRAINSTONE- RUDSTONE. Section 1, 19–23 cm is comprised of very pale brown (10YR 8/2) ALGAL RUDIST GRAINSTONE; grains are well rounded, coarse to very coarse grained, and poorly sorted. Rudist pieces (caprinids) are abundant, as are fragments of red algae (corallinaceans); large benthic foraminifers also occur (especially orbitoids). This grainstone is strongly cemented (PE5C calcitic cement). The overall porosity is low except for cavities, which are several mm in size (moldic porosity MOcr PB5C). A large caprinid fragment is lined by a reddish (10YR 6/6) film. Section 1, 23–26 cm, is comprised of very pale brown (10YR 8/2) ALGAL RUDIST GRAINSTONE-RUDSTONE. The "matrix" is medium grained and poorly sorted. Fragments of rudists include caprinids and one fragment of radiolite. Fragments of red algae (corallinaceans) are abundant. Strong cementation by calcite cement crusts (PE5C). Encrustations (0.5 mm to 3 mm-thick) of red algae over large pieces of rudists are observed. Section 1, 26–31 cm is comprised of light gray (10YR 7/2) ALGAL RUDIST GRAINSTONE-RUDSTONE, well rounded, poorly sorted and medium to coarse grained. Rudist fragments include caprinids (large fragments) and radiolites. Red algae (corallinaceans) occur as fragments and may form encrustations (averaging 0.3 mm in thickness) over large skeletal pieces. Large benthic foraminifers are also present (orbitoids, which are also fragmented). Porosity is low (BPcf PF5C), except in moldic pores (MOcr by PB5C). PB5C is also in WP pores (crusts of 1 mm in cavities of rudist skeletons). Section 1, 31–36 cm, is comprised of poorly sorted (fine-grained to very coarse-grained and gravels) RUDSTONE. Rudists include large pieces of caprinids and few radiolite fragments. Encrustations (averaging 0.5 mm in thickness) of red algae (especially corallinaceans) occur over large fragments of rudists. Well-rounded large cavities within rudist shells (WP) are rimmed by white calcite cement crusts (2 mm thick), MOcr, PB5C (size of MO pores: 1 to 5 mm), BPcfPE5C. Section 1, 36–39 cm, is a poorly sorted RUDSTONE, (fine grained to very coarse grained

and gravels); grains are well rounded. Some moldic pores result from the dissolution of caprinid fragments. Encrustations of red algae occur over large caprinid fragments. Section 1, 39–42 cm, includes a large (gravel-sized) fragment of stromatoporeid or coral; encrustations of red algae are common over large skeletal fragments. Vugs are observed in the stromatoporeid/coral fragment, VUcrPB5C. Section 1, 42–47 cm, exhibits a large, gravel-sized, fragment of coral encrusted by red algae (0.5 to 1 mm-thick crust). Rudist fragments are bored (mm-sized borings), MOcrPB5C. Isopachous calcite cement crusts in BP pores. Section 1, 47–52 cm, includes rudists, large benthic foraminifers and red algae. The sediment is well rounded and poorly sorted (fine grained to gravel). A shelter-cavity (25 mm x 5 mm) occurs below a large caprinid fragment, MO crPB5C; the average thickness of cement crusts is 0.8 mm. Section 1, 52–61 cm is well rounded and poorly sorted (fine to very coarse-grained with gravels). Large fragments of caprinids or whole specimens are partly encrusted by red algae (1 mm thick). Red algal encrustations also occur over skeletal fragments (especially the largest pieces, but also on large benthic foraminifers). Probable coral fragments. Section 1, 61–67 cm, and 67–75 cm, is the same composition and grain size as the previous piece, but radiolite fragments seem to be more abundant. Coral fragments also occur, MOcr-cfPB4C. Section 1, 75–79 cm, is white (10YR 8/2) to very pale brown (10YR 8/4). Large fragments of caprinids with probable dissolution cavities are partly filled by white drusy calcite cements and then translucent dogtooth-like PB5C; fringes are isopachous. Some translucent PB5C (+ dog-tooth) in WP pores. Section 1, 79–88 cm, and 88–92 cm, is comprised of very pale brown (10YR 8/3) RUDSTONE with a conspicuous patchy aspect. Two specimens of caprinids are noted. Cavities within rudist shells (MO pores) are partly/fully filled with several generations of white PBnC. No distinctive crystal shapes, MOcrPBnC. The matrix is poorly sorted, medium to coarse grained (MOcrPB4C or MOcrPE4C; WPcr/cfPB4C or WPcf PE4C). Section 1, 92–99 cm, and 99–104 cm: Section 1, 92–99 cm, includes a fragment of a coral colony which is apparently in life position, as shown by the regeneration of the colony. Two growth stages are recorded; these are separated by a thin (1 mm-thick) red algal crust. Partial moldic porosity in the coral skeleton (MOcrPB4C). Large BP cavities are partially or fully filled with two generations of calcite cement isopachous crusts, reddish yellow (5YR 7/6) then pink (5YR 7/3), and then white blocky calcite cements. Section 1, 104–107 cm: MO and BPcr/cfPB4C-PE4C. Section 1, 107–115 cm and 115–120 cm are reworked pieces of coral colonies and rudists (caprinids and radiolites); radiolites are deeply bored; borings are 0.5 mm to 3 mm in diameter). The "matrix" is made of well-rounded, poorly sorted (fine- to coarse-grained) fragments of rudists, red algae, and large benthic foraminifers (including orbitoids and others). There are thin encrustations of red algae over bioclasts. (MOcrPB4C; BPcr/cfPE4C) Section 1, 120–129 cm and 129–133 cm, are poorly sorted, well-rounded GRAINSTONE. Rhodoliths (about 1.5 cm in diameter)



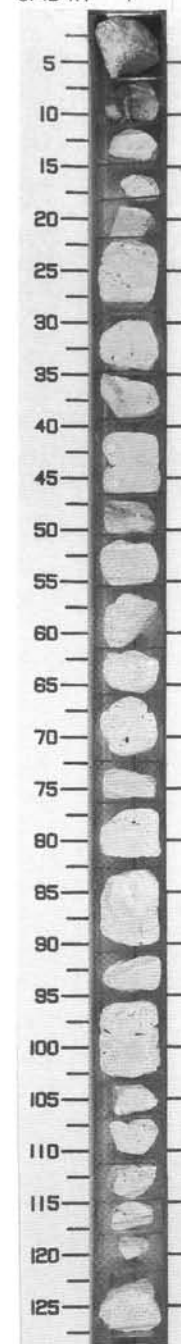
Site 874 Hole A Core 1R Description continued...

are extensively bored (mm-sized borings). Rudist fragments include caprinids and radiolitids. MOcrPB4C. BPcfPEnC. Thin red algal encrustations over gravel-sized skeletal fragments (e.g. caprinids). Section 1, 133–140 cm, includes a large fragment of caprinid rudist with conspicuous molds of pallial canals. Section 1, 140–142 cm and 142–148 cm, contain thick (up to 1.5 cm) crusts of red algae (corallinaceans) over large skeletal fragments. Other encrusters (probable bryozoans) are associated; BP PEnC and MO PBnC. Sect. 2 (0–26 cm) contains 5 pieces of very pale brown (10YR 8/3), fine- to medium-grained ALGAL RUDIST GRAINSTONE. Their composition is similar to those reported in Section 1. Section 2, 0–7 cm, includes a large fragment of coral colony (probable Octocorallia) encrusted by red algae. A network of cavities is filled with white calcite cements. The top of Section 2, 7–12 cm, consists of white calcite cements with a conspicuous banded aspect; these cements are covered by very pale brown (10YR 8/4) to yellow (10YR 8/6) sediments. This may correspond to the infilling of a cavity. Section 2, 12–17 cm, includes a large fragment of caprinid. Section 2, 23–26 cm, includes a fragment of a red algal crust and corals encrusted by red algae (corallinaceans).

General Description:

Cylinders: Section 1: 14–19 cm, 52–61 cm, 67–75 cm, 79–88 cm, 92–99 cm, 104–107 cm, 107–115 cm, 120–129 cm, and 133–140 cm. Rollers: Section 1: 0–3 cm, 7–14 cm, 19–23 cm, 23–26 cm, 26–31 cm, 31–36 cm, 36–39 cm, 39–42 cm, 42–47 cm, 61–67 cm, 75–79 cm, 88–92 cm, 99–104 cm, 115–120 cm, 129–133 cm, and 140–148 cm; Section 2, 0–26 cm. Drilling pebbles: Section 1: 3–7 cm. Thin section samples: Section 1, 7–13 cm, 16–22 cm, 27–30 cm, 30–36 cm, 47–51 cm, 88–92 cm, and 115–120 cm.

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	
1		1	Maastrichtian			T T T	10YR 7/3 To 10YR 8/3	<p>most prominent in Section 1, 11-29 cm, locally constituting half of the rock, and occurs patchily in Section 1, 61 cm, extending into the underlying unit. Red coloration is most pervasive in the early cements and in the adjacent rock matrix. Coarser (>2 mm) components of the rudstone include, in decreasing abundance: caprinid rudists, encrusting red algae (common corallineans; rare squamariaceans), fragments of branching red algae, encrusting stromatoporoids, encrusting chaetetes (now considered calcareous sponges), encrusting worms, encrusting and branching corals, radiolite rudists, sponges, and gastropods. The abundance of encrusters suggest that the larger fragments may have been bound together into boundstone. This is difficult to establish on small cores with incomplete recovery; it may simply reflect sedimentation that was slow enough that grains were heavily encrusted. The SKELETAL GRAINSTONE matrix is generally well-sorted, fine (0.125-0.25 mm, mean) to medium (0.25-0.5 mm, mean) sand, but locally includes a wide range of sizes. The skeletons are mostly fragmented and well rounded; the few recognizable particles include benthic foraminifers (rarely larger foraminifers), red algae, and encrusting worms and/or foraminifers. Porosity ranges from 3% to 10%, is mostly moldic, reduced by cement, and locally vuggy, with some intraparticle and interparticle pores. Multiple generations of cement occur throughout, but no consistent pattern was recognized. Locally, cements are conveniently color coded: eg. in Section 1, 11-14 cm, a clear isopachous medium-grained equant cement (PE3C) is overlain by cloudy, translucent, gray isopachous cement, by milky white or yellow spar, or by clear bladed calcite (PB4C). In Section 1, 14-18 cm, a red band is overlain by cement (125 µm-thick) and then, by gray, translucent, coarse-crystalline cement (PB5C). Only these latter two, were observed in secondary porosity. At Section 1, 39-47 cm, molds are lined by a faint red isopachous crust of calcite (PF74C) and then, by coarser bladed calcite (PB5C). Section 1, 47-51 cm, is comprised of many colored, but mostly white (10YR 8/2), PLANKTONIC FORAMINIFER PACKSTONE. This packstone includes abundant planktonic foraminifers, many fragments of manganese oxide (to 2 mm in diameter), and phosphorite grains (to 1 mm). A single large, encrusted fragment of stromatoporoid, and a probable fish tooth are also noted. A complex sequence of events preceded the deposition of the foraminifer packstone. This sequence is verified by a geopetal fill of a small mold in the packstone. Not all details of the sequence are clear, but the apparent order is (see original sketch): (a.) A laminar stromatoporoid is deposited; the lower layer is stained pale brown; (b.) Lenticular deposits of fine skeletal sand with fragments of corals, stromatoporoids, and larger foraminifers accumulated; (c.) Deposition of a laminated calcite crust, incorporating sediment grains, occurs; the crust may be a cement or a recrystallized encrusting organism; (d.) Development, somehow, of several apparent pillars of skeletal grainstone; this step may represent the erosion of a layer of sediment; (e.) Formation of flanks of encrusting stromatoporoids adjacent to the largest pillar; these may have been encrusted in situ, or have been redeposited. They appear to be rimmed by cement or neomorphic spar. (f.) Deposition of a discontinuous band of white calcite cement. (g.) Deposition of a crust of isopachous, light gray calcite cement. (h.) Truncation of the largest pillar and the two cement crusts. (i.) Deposition of planktonic foraminifer packstone, apparently as internal sediment within the overlying rudist rudstone; the age will probably prove to be younger. Section 1, 51-136 cm, consists of very pale brown (10YR 7/3) ALGAL-STROMATOPOROID-RUDIST BOUNDSTONE with matrix of skeletal grainstone. Major components are radiolite rudists, encrusting stromatoporoids, red algae, corals, caprinid rudists, and other bivalves. This boundstone differs from the overlying unit in containing numerous layers of encrusting stromatoporoids and corals that extend across core pieces; they are apparently interlayered with, or enclosing initially unconsolidated sediment. This is in addition to the extensive encrustation of rudists, some of which appear in growth position (e.g., Section 1, 66-75 cm and 95-104 cm). Also, the relative proportions of rudist groups shifts to predominantly radiolites. Other framework components include globular stromatoporoids, chaetetes, encrusting and boring worms, encrusting foraminifers, boring bivalves (e.g., Section 1, 100 cm), and a possible nautiloid cephalopod (Section 1, 110 cm). Coralline algal clumps reach at least 40 mm in height (e.g., Section 1, 83-88 cm and 123-126 cm). The matrix is skeletal grainstone; locally packstone, generally well-sorted, medium sand (0.25-0.50 mm). Locally a wide range of sizes is represented. Identifiable grains include: bivalve fragments, including both radiolites and caprinids, but mainly unidentified molds; encrusting foraminifers fragments; encrusting worms and larger tubes, likely of worms; and benthic foraminifers, including very rare miliolids and larger foraminifers (e.g., Section 1, 95-107 cm). Cement in larger primary cavities (shelter, bioeroded?) are isopachous calcite crusts, commonly in multiple bands, numbering as many as 7, and >2.5 mm-thick (Section 1, 76-83 cm and 104-107 cm). Solution pores (moldic and vugs) are reduced by thinner crusts of equant or bladed calcite (PE5C; PB5C). The crusts in primary porosity can, in a few cases, be identified as being fibrous.</p> <p>General Description: Cylinders: Section 1, 22-29 cm, 39-47 cm, 83-91 cm, 95-104 cm, and 128-136 cm; Rollers: Section 1, 0-22 cm, 29-39 cm, 47-83 cm, 91-95 cm, and 104-128 cm. Thin section samples: Section 1, 18-22 cm, 40-47, cm and 47-50 cm.</p>
<p>DESCRIPTION</p> <p>MANGANESE-ENCRUSTED & PHOSPHATIZED LIMESTONE, RUDIST RUDSTONE, SKELETAL GRAINSTONE and ALGAL STROMATOPOROID RUDIST BOUNDSTONE</p> <p>Major Lithologies: Section 1; 0-11 cm, consists of black (N2), MANGANESE ENCRUSTED, PHOSPHATIZED LIMESTONE. Manganese encrusts the surface of the limestone and fractures in the limestone. The manganese crust is up to 15 mm-thick, apparently structureless, but possibly botryoidal. Dendrites with tiny laminated hemispheres (botryoids or digitate stromatolites) extend up to 20 mm into the limestone. Replacement appears to follow no pattern although some foraminifers may be selectively impregnated. Other surfaces, (e.g. burrow margins, clast boundaries) appear to have been conduits for manganese. Phosphate is observed as a patchy brownish yellow (10YR 6/6) stain through the limestone. Section 1, 6-11 cm, includes several bone or tooth fragments, many grains (pellets?) and some pebbles which are phosphorite. The limestone is a PELAGIC FORAMINIFER PACKSTONE, including echinoderms, rare mollusk fragments, very rare miliolids, and several large bored ovoids, 2 to 4 mm in size, that may be sponges or rounded mollusk fragments. Burrows, 0.2 mm to 1.0 mm in diameter, are straight, branching, or form networks; these burrows are filled with gray (N5/1) mud-sparse planktonic foraminifers. The limestone is cut by many fractures and possible bores. An extremely complex series of isopachous, fibrous cements (calcite; some possibly phosphate) line the early fractures, which appear as a series of parallel sheets. These cements are cut by a wide fracture (or boring) that contains pelagic foraminifers, granules, and extensive manganese crusts. The final cement appears to be a very coarse clear crystalline rhombic spar (calcite?) with curved faces. Section 1, 11-47 cm, consists of RUDIST RUDSTONE with SKELETAL GRAINSTONE matrix. The color is very pale brown (10YR 7/3-8/3), with large domains of reddish yellow (7.5YR 6/8). Reddish color is</p>								



SITE 874 HOLE B CORE 2R

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color
1		1	Maastrichtian			T	10YR 8/2 To 10YR 7/3
2		2				T	

DESCRIPTION

SKELETAL GRAINSTONE, MOLLUSK RUDSTONE, BIVALVE GRAINSTONE, SKELETAL PACKSTONE, and GASTROPOD WACKESTONE

Major Lithologies:

Section 1, 0–24 cm, consists of light gray (10YR 7/2) SKELETAL GRAINSTONE with abundant fragments of red algae and bivalves. Fragments of black manganese microconcretions are common; a few of such concretions are ~0.75 mm in diameter and have internal cavities filled with calcite cement (PE2C). Section 1, 0–9 cm, includes a large, highly recrystallized rudist fragment, 6 mm-long. Fragments of red algae, up to 2 cm-long, occur in Section 1, 15–24 cm. Porosity averages 2%. Section 1, 24–30 cm, is comprised of light gray (10YR 8/2) MOLLUSK RUDSTONE with abundant molds of gastropods and bivalves which are generally larger than 2 mm. Many of the molds are partially filled with multiple generations of very dense calcite cement in which individual calcite crystals are not distinguishable. Gastropod molds are partially filled with bladed crusts of calcitic cement. Section 1, 30–48 cm, consists of a white (10YR 8/2) and very pale brown (10YR 7/3) BIVALVE GRAINSTONE. This grainstone includes abundant highly recrystallized bivalve (rudists?) fragments. Larger foraminifers occur in trace abundances; small black grains correspond to manganese microconcretions. There are multiple generations of banded (white and very pale brown), dense calcite cements. Porosity averages 5% and is

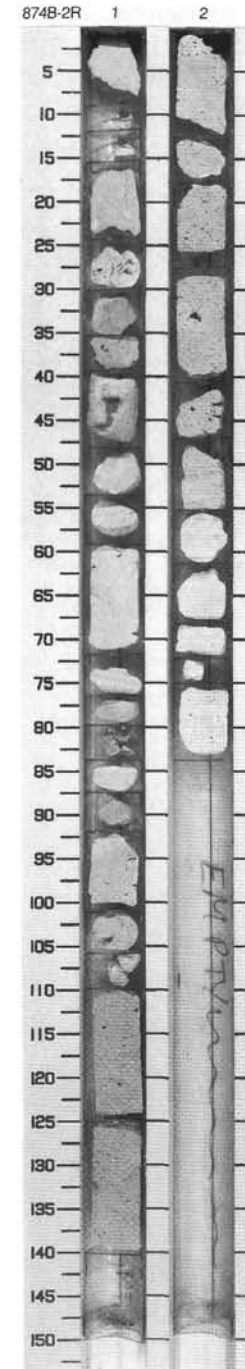
mostly moldic; intraparticle pores are reduced by calcite cement crusts. In Section 1, 35–40 cm, gastropod molds become abundant, some up to 1 cm-long. Banded rinds of dense calcite cement now have a last rind of cement that is rusty orange in color. Porosity ranges from 8% to 10% and is mostly moldic. In Section 1, 40–48 cm, a U-shaped cavity (8 cm-long by 6 cm-wide) is partially filled with banded rinds of dense calcite cement, the last rind is rusty orange in color. Overlying the multiple generations of cement is a very pale brown (10YR 8/4) fine-grained skeletal grainstone. Bivalve fragments are abundant. This sediment fill (internal sediment?) is a distinctly different facies than the host rock. Porosity averages 15% and is mostly moldic, with some solution enlarged interparticle. Few of the moldic pores are partially filled with bladed calcite cement crusts (PB3C). Section 1, 48–140 cm, is comprised of white (10YR 8/2) to very pale brown (10YR 7/3) SKELETAL GRAINSTONE. This skeletal grainstone includes abundant bivalve (rudists?) fragments, common red algae fragments, and rare larger foraminifers. Molds of bivalve and gastropods are common. Porosity ranges from 5% to 20% and is mostly moldic with few solution enlarged interparticle pores. Cavity-fill of banded, dense calcite cement with internal sediment(?) is present in Section 1, 53–59 cm. Thinly "bedded" (<40 mm), well-packed, angular to subround bivalve fragments "layers" occur in Section 1, 71–76 cm. These "beds", or layers, alternate in color from white to very pale brown. Black dendritic grains (manganese?) seem to be concentrated in the white layers. In Section 1, 80–84 cm, a drilling pebble has 2 parallel, E-W oriented, lime mud-filled "seams" which are connected near the edge of the pebble. The host material is SKELETAL GRAINSTONE, which consists of abundant bivalve fragments, manganese microconcretion fragments, and brown colored grains (stained by phosphate?). Section 2, 0–18 cm, consists of a very pale brown (10YR 7/3) SKELETAL PACKSTONE, with abundant larger foraminifers, few miliolids, few rudist (radiolitid) fragments, few gastropods, and abundant bivalve(?) fragments. In Section 1, 0–13 cm, there is one mold of a caprinid fragment with closely-spaced polygonal canals. A 1–2 cm-long caprinid mold in Section 1, 13–18 cm is nearly filled by cement; the most recent layer is a bladed calcite crust (PB3C). This skeletal packstone also includes brown shell fragments of uncertain origin, few red algae and two white lithoclasts, one with a larger foraminifer. Moldic porosity ranges from 5% to 10%, after bivalves and gastropods; thin crusts of bladed calcite cement (PB3C) occur in molds. Some pore spaces are filled by light yellow cement, but the crystal

boundaries are not visible. Section 2, 18–50 cm, is comprised of a GRAINSTONE or a PACKSTONE, depending on the original matrix. Difficult to see and appears chalky in places. Vague grains are visible in the matrix in Section 2, 18–28 cm. "Chalkiness" increases towards the base of the interval. One caprinid rudist fragment (2 x 3 cm in size) is observed in Section 2, 18 cm. Moldic porosity ranges from 20% to 25%; vuggy porosity is 5% to 10%. One vug (or a solution enlarged mold) is 1 to 1.5 cm in diameter. Very little cement is visible. At Section 2, 50 cm, there is a sharp contact within a single piece, between the overlying lithology from Section 2, 18–50 cm, and the underlying, laminated GASTROPOD WACKESTONE, in Section 2, 50–83 cm. In Section 2, 50–55 cm, a 4 cm-thick bed, that is pale brown at the top and grades down into white, is in sharp contact with the pale brown top of another bed. The laminations are cut irregularly with white fill, possibly the result of burrowing. Moldic porosity at the top of Section 2, 50–83 cm, is 5% to 10% after gastropods, bivalves, and possible miliolids. One (1 mm x 10 mm) tube-shaped pore (burrow or fill) in Section 2, 55–61 cm is only partly filled by white chalky limestone. Vague grains are visible coating the unfilled portion of this tube; these may be remnants of the once grainy matrix, or may be part of the pore filling. Pale brown laminae in this same interval are scalloped, with domed surfaces facing upwards (the assumed orientation is based on comparing color variation trends with similar variations in an oriented piece at the top of the interval). Mottling becomes more irregular towards the base of Section 2, 50–83 cm, as does grains size (one gastropod reaches 1 cm in size), the apparent concentration of grains, and moldic porosity (which is near 15%, probably related to more grains). In Section 2, 75–83 cm, white laminae in an overall pale brown matrix are offset vertically by 0.5 cm. This may be the result of loading or fluid escape. At least one Dasycladacean algae mold was found in this interval.

General Description:

Cylinders: Section 1, 0–9 cm, 15–24 cm, 40–48 cm, 59–71 cm, 92–101 cm, and 110–140 cm; Section 2: 0–13 cm, 18–40 cm, 47–55 cm, 61–72 cm, and 75–83 cm. Rollers: Section 1, 24–40 cm, 48–59 cm, 71–80 cm, 84–92 cm, and 101–106 cm; Section 2, 13–18 cm, 40–47 cm, and 55–61 cm. Drilling pebbles: Section 1, 9–15 cm, 80–84 cm, and 106–110 cm; Section 2, 72–75 cm. Thin section samples: Section 1, 19–21 cm, 35–39 cm, 67–69 cm, 84–87 cm, and 126–130 cm; Section 2, 1–4 cm and 76–79 cm.

CORED 9.7–19.2 mbsf



874A-1R CORED 0.0 - 7.0 mbsf

Meter	Graphic Lith.	Section	Age	Calc. nanno.	Plank. foram.	Larger foram.	Structure	Disturb.	Sample	Color
1 2		1	Maastrichtian	CP11/12 CP14a	P13 P7/8 P4?	Maastrichtian	Mn &	+	T T T T	
		2		A.G	A.G	F.M		+	T T	

874B-1R CORED 0.0 - 9.7 mbsf

Meter	Graphic Lith.	Section	Age	Calc. nanno.	Plank. foram.	Larger foram.	Structure	Disturb.	Sample	Color
1		1	Maastrichtian			Maastrichtian		+	T T	10YR 7/3 To 10YR 8/3
				B	B	F.M		+		

874B-2R CORED 9.7 - 19.2 mbsf

Meter	Graphic Lith.	Section	Age	Calc. nanno.	Plank. foram.	Larger foram.	Structure	Disturb.	Sample	Color
1 2		1	Maastrichtian			Maastrichtian		+	T T	10YR 8/2 To 10YR 7/3
		2		B	B	C,M		+	T T	

SITE 874 HOLE B CORE 3R

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color
1		1	Maastrichtian			T	10YR 8/2 To 10YR 7/3
2		2				T	
3		3				T	

DESCRIPTION

BIVALVE PACKSTONE, MOLLUSK GRAINSTONE, SKELETAL WACKESTONE-PACKSTONE, and SKELETAL GRAINSTONE

Major Lithologies:

Section 1, 0–21 cm, is comprised of white (10YR 8/2) BIVALVE PACKSTONE including common bivalve (rudists?) fragments and molds. A pod (burrow fill?) of very pale brown (10YR 7/3) bivalve grainstone occur in Section 1, 0–6 cm. Within this "pod", bivalve fragments (caprinid fragments?) are up to 1 cm-long and 0.5 cm-wide. Many red algae occur in Section 1, 21–29 cm. Porosity averages 3% and is mainly moldic. Rare bladed crusts of calcite cements occur in molds. Section 1, 21–92 cm, is comprised of a white (10YR 8/2) and very pale brown (10YR 7/3) MOLLUSK GRAINSTONE. In this grainstone, fragments and molds of bivalves and gastropods are abundant; red algae and benthic foraminifers increase in abundance towards the bottom of this facies, where they are many and few, respectively. Porosity averages 15%–20% and is mostly moldic and intraparticle, with few vugs. Calcite cement is abundant and commonly consists of bladed calcitic crusts (PB4C). In Section 1, 21–29 cm, brown crystals (phosphorite?) infill pores of the grainstone. In Section 1, 21–29 cm, mollusk molds form layers that are inclined 20° (SW-NE) from horizontal. In Section 1, 29–50 cm, the same features as above are inclined 20° (SE-NW) from horizontal. A pinkish orange rind of cement with black dendritic grains (manganese?) occurs in Section 1, 50–54 cm and 57–63 cm. The lime mud content increases from Section 1, 63–78 cm (packstone?). An undulatory contact with the underlying unit is observed in Section 1, 92 cm.

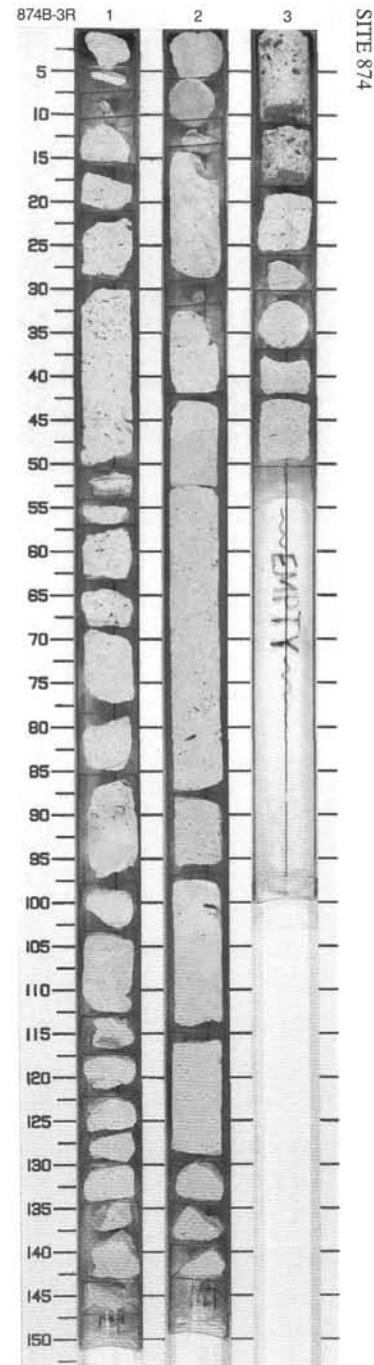
Section 1, 92–103 cm, is comprised of white (10YR 8/2) to very pale brown (10YR 7/3) SKELETAL PACKSTONE. This packstone includes abundant red algae, bivalve fragments, and benthic foraminifers. Most allochems are less than 500 µm in size (fine sand size). Porosity is 1%. Cement is few and mostly corresponds to bladed calcite crusts (PB2C). Section 1, 103–113 cm, consists of a complicated mix of four facies which are separated from each other by irregular, undulating contacts. The uppermost 2 cm are very pale brown (10YR 7/3) with common bivalve fragments and red algae; black dendritic grains correspond to manganese microconcretions. The underlying facies is a white (10YR 8/2), wedge-shaped, CHALKY LIMESTONE. Bivalve fragments are discernable and few, but the distinctive feature is a massive obliteration of rock fabric by recrystallization. The underlying unit is a very pale brown (10YR 7/4) WACKESTONE, which seems to be similar to the "internal sediment" noted previously (i.e. mud-rich facies filling cavity or solution seam). Areas of the wackestone have a pinkish orange color. The lowermost facies is a SKELETAL PACKSTONE, which is light gray (10YR 7/2). This skeletal packstone includes common benthic foraminifers, many bivalve fragments, and few red algae. Matrix is heavily recrystallized. Section 1, 113–118 cm, is comprised of SKELETAL GRAINSTONE and WACKESTONE. The lower 3/4 of this sample is light gray (10YR 7/2) SKELETAL GRAINSTONE, with common bivalve and red algae fragments and many benthic foraminifers. Porosity is 1%. The uppermost 1/4 of this sample is a WACKESTONE. The contact between the two facies is sharp and scalloped. Color varies from pink (5YR 8/4) to light reddish brown (2.5YR 6/4) and pinkish gray (5YR 6/2). This sediment is similar to the "internal sediment" noted previously. The uppermost plate layer has common bivalve fragments and black dendritic grains. The lower red sediment does not readily fizz when tested with acid (dolomite?). In Section 1, 118–122 cm, the facies is very similar to above, with additional white (10YR 8/2) lenses of very dense carbonate sediment. Yellowish brown "bulbous" cements are observed. Section 1, 122–147 cm, consists of white (10YR 8/2) SKELETAL GRAINSTONE. This grainstone includes abundant bivalve fragments and red algae; benthic foraminifers become abundant in Section 1, 122–126 cm, with many to few below. Porosity ranges from 3% to 5% and is mostly moldic, microvuggy, and interparticle. Calcite cement is few, mostly bladed (PB4C) with a bulbous morphology. Pockets of reddish brown "internal sediment" and geopetals of the same, occur sporadically in this interval. Near the base of this interval, porosity increases to 10%, with extensive leaching of rudists. Section 2, 0–6 cm, is comprised of white (10YR 8/2) BIVALVE GRAINSTONE, with abundant bivalve fragments and molds. Porosity ranges from 10% to 25% and is moldic, vuggy, and interparticle. This grainstone is not well cemented. Section 2, 6–13 cm, consists of a very pale brown (10YR 7/3) SKELETAL GRAINSTONE. This grainstone is highly recrystallized and includes common bivalve fragments, common red algae, and many benthic foraminifers. Porosity is 3% and is moldic and

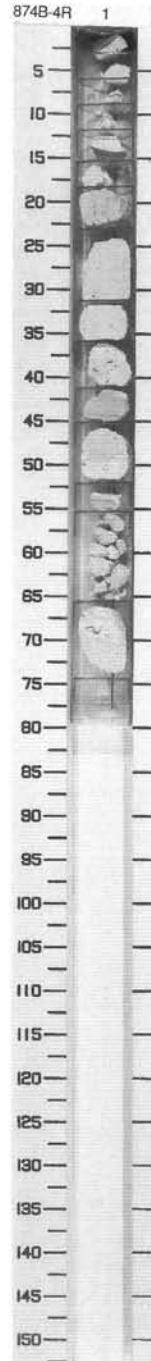
intraparticle. Cement is common, and corresponds mostly to bladed calcite crusts (PB4C). Section 2, 13–142 cm, is comprised of light gray (10YR 7/2) SKELETAL GRAINSTONE. Skeletal components include abundant rudist fragments, many benthic foraminifers, rare gastropods, traces of calcareous sponges (chaetids?), and common red algae. The upper surface has a scalloped contact with a rusty brown "internal sediment" including black dendritic grains. Section 2, 32–41 cm, contains small caprinids whose internal cavity contains a rind of rusty orange "internal sediment". The back-side of the sample contains more of the same. Porosity ranges from 5% to 7%; it is mostly moldic with few intraparticle pores and rare microvugs. Cement corresponds to bladed calcite crusts (PB4C). Rare, large burrows (larger than 6 mm) are filled with pellets. Section 3, 0–18 cm, consists of white (10YR 8/2) RUDIST RUDSTONE, with abundant radiolitic rudists and many complete foraminifers (a garden?), which are commonly 3 cm-long. Encrusters (algae or foraminifers?) are located near the base of a few radiolitics. Porosity averages 10% and is mostly moldic after rudists. Matrix is heavily recrystallized. Section 3, 18–30 cm, includes white (10YR 8/1) GASTROPOD WACKESTONE and "chalky" SKELETAL PACKSTONE. The color is very pale brown (10YR 7/3). The wackestone has abundant coats and molds of gastropods. Porosity averages 7%, mostly after gastropod molds. Cement is very rare. The packstone has many bivalves, red algae fragments, and trace abundances of brown phosphate grains. The most characteristic feature of this facies is its highly leached or "chalky" appearance. Porosity averages 20% and is mostly moldic, microvuggy, and interparticle. Section 3, 30–50 cm, consists of a very pale brown (10YR 7/3) SKELETAL PACKSTONE. In Section 3, 30–37 cm, this packstone is well indurated and includes abundant bivalve fragments and common red algae fragments. Rusty-orange "internal sediment" forms geopetal filling of the mold of an encruster. The backside of the sample has similar "internal sediment". Porosity is 5%, and is mostly moldic. Calcite cement is rare. From Section 3, 37–50 cm, this packstone includes abundant bivalve fragments, common red algae, and benthic foraminifers; black grains are very rare. The main difference with the overlying interval (Section 3, 30–37 cm) is the much greater porosity (about 20%). Porosity is mostly moldic, with few intraparticle pores.

General Description:

Cylinders: Section 1, 21–50 cm, 57–63 cm, 68–98 cm, 103–113 cm, and 130–135 cm; Section 2, 13–29 cm and 32–129 cm; Section 3, 0–26 cm and 37–50 cm. Rollers: Section 1, 11–21 cm, 50–57 cm, 63–68 cm, 98–103 cm, 113–130 cm, and 135–147 cm; Section 2, 0–10 cm and 129–142 cm; Section 3, 26–37 cm. Drilling pebbles: Section 1, 0–11 cm; Section 2, 10–13 cm and 29–32 cm. Thin section samples: Section 1, 51–54 cm and 114–118 cm; Section 2, 37–38 cm; Section 3, 118–120 cm.

CORED 19.2–28.7 mbsf





Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	DESCRIPTION		
5-15	PPPPPPPP	1	Maastrichtian	☾			10YR 8/2 to 10YR 8/3	<p>DESCRIPTION SKELETAL GRAINSTONE, PACKSTONE AND WACKESTONE and CHALKY MUDSTONE</p> <p>Major Lithologies: Section 1, 0-18 cm, consists of alternations of white (10YR 8/2) to very pale brown (10YR 8/3) SKELETAL PACKSTONE to GRAINSTONE, and white (10YR 8/2) CHALKY MUDSTONE. The SKELETAL PACKSTONE to GRAINSTONE is medium to coarse grained and includes 15% of skeletal grains with a few grains of rudist. Leached porosity averages 5%, with voids lined by dogtooth sparry calcite. Some voids are geopetally infilled by limonite stained calcisiltite. The MUDSTONE contains casts of small gastropod shells; there is minor moldic porosity with voids coated by dogtooth sparry calcite (3%). Section 1, 18-23 cm, consists of coarse-grained, very pale brown (10YR 8/3), SKELETAL GRAINSTONE, with unsorted grains of rudists and foraminifers. Porosity is 5%, mostly moldic. This grainstone overlies a fine-grained FORAMINIFER-ALGAL GRAINSTONE. At the top of the coarse grainstone is a cavity with multiple layers of infilling. The cavity walls are first lined by translucent, in places botryoidal, sparry calcite. This was followed by two periods of micrite deposition and then by limonite staining of the micrite surface. The last stage of cavity infilling corresponds to silt size skeletal debris and tubular (algae?) forms which were leached out. Section 1, 23-37 cm, consists of white (10YR 8/2), chalkified SKELETAL WACKESTONE. This wackestone includes benthic foraminifers (4%), small gastropod shell casts and bivalve fragments. Leached, moldic porosity is minor (3%). Section 1, 37-45 cm, is comprised of coarse-grained, unsorted, very pale brown (10YR 8/3) SKELETAL GRAINSTONE. Skeletal components include the grains of rudists, red algae, and foraminifers. There is minor vuggy porosity, with voids filled by white micrite. Section 1, 45-52 cm, consists of white (10YR 8/1) SKELETAL MUDSTONE, which overlies a sharp contact at Section 1, 47 cm, with a coarse-grained skeletal packstone of the same composition as in Section 1, 23-37 cm. Section 1, 52-55 cm, is a caprinid shell infilled by white skeletal mudstone. Section 1, 55-65 cm, is a drilling breccia made of pieces of skeletal packstone. This skeletal packstone includes recognizable grains of gastropod, bivalve shells, and red algae debris. Skeletal grains were extensively leached out, resulting in high moldic porosity (15%). Section 1, 65-74 cm, includes a large rudist shell fragment, that is partially encrusted by an algae and underlain by a coarse-grained, very pale brown (10YR,8/3) skeletal grainstone. This grainstone contains larger foraminifers, red algae, gastropod and bivalve shell fragments, and unidentifiable skeletal grains.</p> <p>General Description: Cylinders: Section 1, 23-31 cm, 45-52 cm, and 65-74 cm. Rollers: Section 1, 18-23 cm and 31-45 cm. Drilling pebbles: Section 1, 0-18 cm and 52-65 cm. Thin section samples: Section 1, 31-36 cm, 36-41, cm and 53-55 cm.</p>		
15-25	PPPPPPPP					☾			T	
25-35	PPPPPPPP					☾			T	
35-45	PPPPPPPP			☾						
45-55	PPPPPPPP			☾		T				
55-65	PPPPPPPP			☾						
65-75	PPPPPPPP			☾						
75-85	PPPPPPPP			☾						
85-95	PPPPPPPP			☾						
95-105	PPPPPPPP			☾						
105-115	PPPPPPPP			☾						
115-125	PPPPPPPP			☾						
125-135	PPPPPPPP			☾						
135-145	PPPPPPPP			☾						
145-150	PPPPPPPP			☾						

SITE 874 HOLE B CORE 5R

CORED 38.1 – 47.6 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color
1		1	Maastrichtian			T	10YR 8/2
2		2				T	
						T	

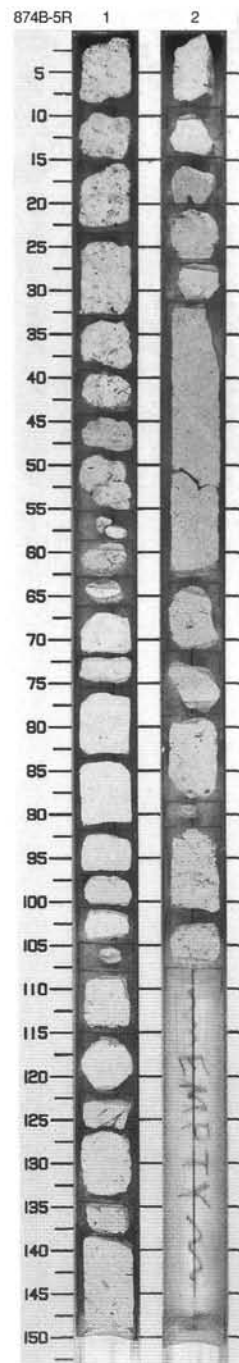
DESCRIPTION**ALGAL RUDIST GRAINSTONE AND RUDSTONE and GASTROPOD RUDIST RUDSTONE****Major Lithologies:**

Section 1, 0–63 cm, is comprised of white (10YR 8/2) ALGAL RUDIST GRAINSTONE AND RUDSTONE. Radiolite rudists are generally fragmented, except for some small specimens (1 cm in diameter or less); a few of them are in life position and constitute small clusters of individuals encrusted by red algae. Other components of this grainstone and rudstone include common fragments of gastropods (few mm to 1 cm-long), and few coral fragments and benthic foraminifers (including orbitoids); red algae occur as fragments and thin encrustations over skeletal fragments. Generally, the grains are well rounded. The "matrix" is poorly sorted, medium to very coarse-grained. This grainstone and rudstone is well cemented, especially by equant calcite cements (PE4C). Porosity is low, mostly moldic, and is reduced by bladed calcitic crusts (PB5C). Section 1, 39–44 cm, includes radiolites in life position which may be encrusted by red algae. Cementation is less important than in the overlying beds; some interparticle pores are open. Section 1, 63–149 cm, consists of ALGAL RUDIST GRAINSTONE. Grains are well rounded; however, the sediment is poorly sorted (medium to very coarse grain-sized). Rudists (radiolites) are common, as are red algae (corallineans); other components, are few gastropods, small bivalves (mostly leached), benthic foraminifers (including orbitoids), and rare corals. Porosity

is mostly moldic, after the leaching of bivalve fragments with few intraparticle pores (and having no cementation). Caprinid and coral fragments are observed in Section 1, 97–101 cm. Porosity increases from Section 1, 101 cm, downwards; the porosity is mostly moldic, after the leaching of bivalves and gastropods, to vuggy. Section 1, 101–126 cm, is comprised of medium- to coarse-grained GRAINSTONE, with very small radiolites, about 2 cm-long. In Section 1, 126–145 cm, there are burrows infilled by coarse-grained sediments. There are also: one small radiolite (0.5 cm in diameter), small bivalves (few millimeters long) and thin red algal encrustations over large skeletal fragments. Section 2, 0–101 cm, consists of very pale brown (10YR 8/3) ALGAL RUDIST GRAINSTONE AND RUDSTONE. They are medium to coarse grained. Skeletal components include fragments of rudists and red algae and, to a lesser extent, gastropods and thin-shelled bivalves; benthic foraminifers (including orbitoids) and coral fragments (e.g. Section 2, 20–26 cm and 91–101 cm) are rare. These grainstone and rudstone facies are very porous; the porosity is interparticle and vuggy. Scattered black grains correspond to manganese-encrusted grains. In Section 2, 26–31 cm, there is a contact between an algal-rudist grainstone and a WACKESTONE (only 1 cm is visible on the sample), with large benthic foraminifers (orbitoids) and small radiolites (0.5 cm in diameter) with geopetal infillings. The contact between the two layers seems to be gradational. In Section 2, 31–63 cm, a fining-upward pattern (poorly sorted very coarse to medium grained) is observed. In Section 2, 63 cm, interparticle pores display a laminar pattern. In Section 2, 71–79 cm, two layers of PACKSTONE with benthic foraminifers (orbitoids), rudist fragments, and small gastropods are separated by a coarse-grained GRAINSTONE. Section 2, 101–108 cm, is comprised of very pale brown (10YR 8/3) GASTROPOD RUDIST RUDSTONE. Coral fragments are more abundant than in the previous facies. Porosity is mostly interparticle and moldic, after the leaching of gastropods and bivalve fragments.

General Description:

Cylinders: Section 1, 0–8 cm, 15–32 cm, 75–91 cm, 108–115 cm, 126–134 cm, and 138–149 cm; Section 2, 0–9 cm, 31–71 cm, 79–88 cm, and 91–101 cm. Rollers: Section 1, 8–15 cm, 32–55 cm, 66–75 cm, 91–104 cm, 115–126 cm, and 134–138 cm; Section 2, 9–31 cm, 71–79 cm, and 101–108 cm. Drilling pebbles: Section 1, 55–66 cm and 104–108 cm; Section 2, 88–91 cm. Thin section samples: Section 1, 8–14 cm, 84–86 cm, and 134–138 cm; Section 2, 60–64 cm and 100–101 cm.



874B-3R

CORED 19.2 - 28.7 mbsf

Meter	Graphic Lith.	Section	Age	Calc. nanno.	Plank. foram.	Larger foram.	Structure	Disturb.	Sample	Color
1		1	Maastrichtian				∇ R		T	10YR 8/2 To
2		2	Maastrichtian				↑F		T	10YR 7/3
3		3		B	B	C,M			T	

874B-4R

CORED 28.7 - 38.1 mbsf

Meter	Graphic Lith.	Section	Age	Calc. nanno.	Plank. foram.	Larger foram.	Structure	Disturb.	Sample	Color
1		1	Maastrichtian				∇ R		T	10YR 8/2 To
2		2	Maastrichtian				∇ R		T	10YR 8/3
3		3		B	B	C,M	∇ R		T	10YR 8/1
4		4					∇ R		T	10YR 8/3

874B-5R



CORED 38.1 - 47.6 mbsf

Meter	Graphic Lith.	Section	Age	Calc. nanno.	Plank. foram.	Larger foram.	Structure	Disturb.	Sample	Color
1		1	Maastrichtian				∇ R		T	10YR 8/2
2		2	Maastrichtian	B	B	C,M	∇ R		T	
3		3					∇ R		T	

SITE 874 HOLE B CORE 6R

CORED 47.6–57.2 mbsf

874B-6R 1 2

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color
1		1	Maastrichtian			T	10YR 8/2
		2				T	

DESCRIPTION

SKELETAL FORAMINIFER GRAINSTONE, CORAL RUDIST RUDSTONE, and CORAL ALGAL RUDIST BOUNDSTONE

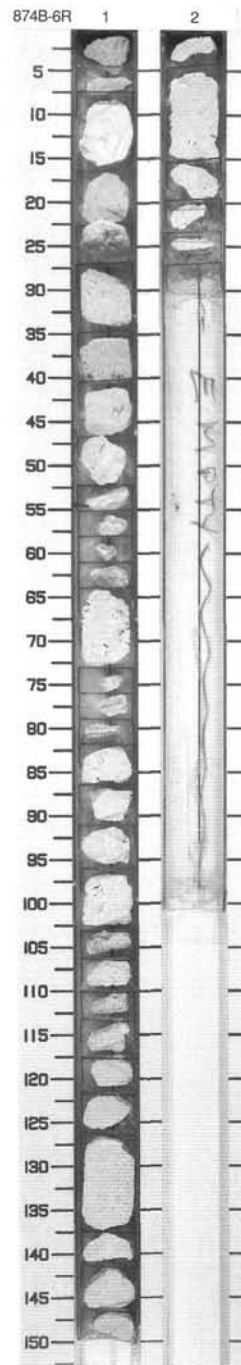
Major Lithologies:

Section 1, 0–4 cm, consists of white (10YR 8/2) poorly sorted SKELETAL PACKSTONE with abundant black specks corresponding to reworked manganese grains, or recrystallized grains coated by manganese. Yellowish grains are also present (phosphate grains?). Other components are large benthic foraminifers (broken) and recrystallized bioclasts. Section 1, 4–7 cm, is composed of white (10YR 8/2) fine to very fine-grained SKELETAL GRAINSTONE, with a basal layer which has a conspicuous lenticular shape. Grains are fragments of rudists, red algae, and thin-shelled bivalves. This grainstone is very porous; porosity is mostly intergranular. In Section 1, 7–16 cm, there is a contact between two SKELETAL WACKESTONES, light gray (10YR 7/2) at the base, white (10YR 8/2) at the top. The lower wackestone includes small thin-shelled bivalves and small benthic foraminifers. Fenestrae are abundant and consist of vertically elongated tiny tubules. The contact between the two wackestones is sharp and undulate. At the top, the white wackestone includes abundant fenestrae which may form an irregular network. A fracture (2 mm-wide) is filled with bioclasts and by a white calcitic cement. Few fragments of thin-shelled bivalves occur. Larger cavities, a few millimeters to centimeters in size, are partially filled with geopetal bioclastic sediments, and are then cemented by white isopachous calcite cement crusts.

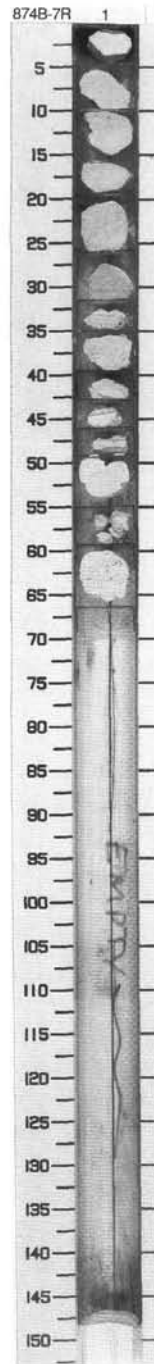
Geopetal infillings may be lacking. Fenestrae may be also partly filled and then cemented by isopachous calcite cement crusts. Section 1, 16–150 cm, is comprised of SKELETAL FORAMINIFER GRAINSTONE, CORAL RUDIST RUDSTONE, and CORAL ALGAL RUDIST BOUNDSTONE. Section 1, 16–58 cm, 86–91 cm and 142–150 cm, consists of white (10YR 8/2), poorly sorted (fine to very coarse-grained), SKELETAL FORAMINIFER GRAINSTONE. Grains are well rounded. This grainstone includes abundant benthic foraminifers (especially orbitoids), fragments of rudists (radiolitids), red algae (corallinaceans), and few gastropods and small bivalves. Porosity is mostly moldic to vuggy with solution-enlarged pores. This porosity is moderately reduced by bladed calcite crusts (PB4C). Cements with a "bulbous" morphology occur in large cavities. Section 1, 64–86 cm, 91–110 cm, and 127–138 cm, is comprised of CORAL RUDIST RUDSTONE. The composition of the rudstone is very similar to that of the SKELETAL FORAMINIFER GRAINSTONE, but there are large fragments or colonies of corals (corallites, 1 cm in diameter) and rudists (caprinids and radiolitids) encrusted by red algae (corallinaceans). Section 1, 110–127 cm and 138–142 cm, is comprised of CORAL ALGAL RUDIST BOUNDSTONE. The "matrix" is similar to the SKELETAL FORAMINIFER GRAINSTONE. A radiolitid cluster encrusted by red algae is recorded in Section 1, 122–127 cm. Section 2, 0–27 cm, is comprised of white (10YR 8/2) CORAL ALGAL RUDIST BOUNDSTONE. There are encrustations of red algae, up to 1 cm-thick, over coral colonies and fragments of rudists (small radiolitids, 0.5 cm in diameter, and caprinids); these crusts are usually bored. The matrix is made of poorly sorted grainstone, with fragments of rudists, red algae, echinoids, corals, and larger foraminifers (orbitoids). Porosity is vuggy (pores up to several mm in size) and moderately reduced by isopachous crusts of bladed calcite cement; this cement is usually stained reddish yellow (5YR 7/6).

General Description:

Cylinders: Section 1, 27–40 cm, 64–73 cm, 96–103 cm, and 127–138 cm; Section 2, 4–15 cm. Rollers: Section 1, 7–27 cm, 40–52 cm, 82–96 cm, 103–110 cm, 122–127 cm, and 142–146 cm; Section 2, 0–4 cm and 15–19 cm. Drilling pebbles: Section 1, 0–7 cm, 52–64 cm, 73–82 cm, 110–122 cm, 138–142 cm, and 146–150 cm; Section 2, 19–27 cm. Thin section samples: Section 1, 8–10 cm and 127–130 cm; Section 2, 1–3 cm.





Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	DESCRIPTION
		1	Maastrichtian			T	10YR 8/3	<p>DESCRIPTION CORAL FRAMESTONE</p> <p>Major Lithology: Section 1, 0–66 cm, is comprised of FRAMESTONE and PACKSTONE. The CORAL FRAMESTONE is very pale brown (10YR 8/3) except in Section 1, 0–5 cm, where it is white (10YR 8/1). This framestone is primarily composed of tabular corals with heavy encrustation of red algae (corallinaceans and very rare squamariaceans), worms and/or foraminifers. In the matrix, fragments of rudists (radiolitids and caprinids), gastropods, and chaetetids are rare. Some encrusting corals are patchily or completely neomorphosed to fine calcite. A matrix of medium-grained (1/4–1/2 mm) FORAMINIFER PACKSTONE surrounds the corals; the sorting is moderate and the roundness is low. The matrix includes abundant larger foraminifers and many fragments of encrusting worms and/or foraminifers, red algae (corallinaceans), and small mollusks. In Section 1, 46–49 cm, a 20 mm interval of dense lime mudstone is probably the internal fill of a body cavity or shelter. Porosity is moldic throughout this core, with local additions of solution enlarged pores. Fine interparticle pores (sx sms BP) are noted in Section 1, 0–5 cm and 43–46 cm. Porosity varies with depth. It is 15% in Section 1, 0–5 cm, 2% to 5% in Section 1, 5–40 cm, and 10% to 15% in Section 1, 40–66 cm; porosity is 40% in Section 1, 43–46 cm. Visible cement is minor medium crystalline calcite crusts (PE4C) in molds. Matrix cementation is nearly complete; high porosity results from "inversion", cement-filled pores remain as grains are entirely dissolved.</p> <p>General Description: Rollers: Section 1, 0–31 cm, 35–40 cm, 49–55 cm, and 59–66 cm. Drilling pebbles: Section 1, 31–35 cm, 40–49 cm, and 55–59 cm. Thin section samples: Section 1, 55–58 cm.</p>

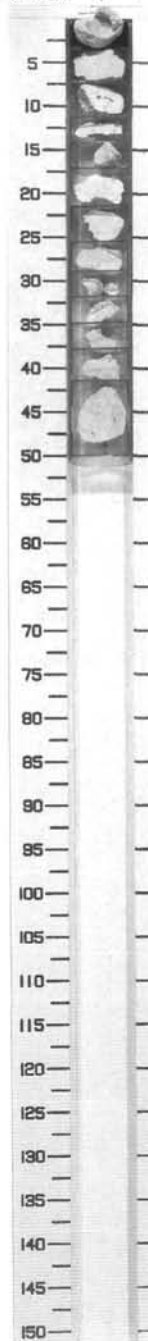


SITE 874 HOLE B CORE 8R

CORED 66.9 – 76.6 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	DESCRIPTION
		1	Maastrichtian				10YR 8/2	<p>DESCRIPTION</p> <p>SKELETAL ALGAL GRAINSTONE and ALGAL CORAL BOUNDSTONE</p> <p>Major Lithologies:</p> <p>Section 1, 0–17 cm, consists of white (10YR 8/2), fine- to medium-grained, SKELETAL ALGAL GRAINSTONE. It includes gastropods, small bivalves (usually leached), larger foraminifers (especially orbitoids), and fragments of red algae and rudists (caprinids and radiolitids). Coral colonies (with corallites of 3 mm in diameter) occur in Section 1, 7–11 cm and 22–26 cm. Pink (5YR 8/3) to pinkish white (7.5YR 8/2), large micritic lithoclasts are reported in Section 1, 26–29 cm. Thin fissures in this limestone are stained pink (5YR 8/4). The grainstone is very porous; the porosity is mostly moldic, with solution-enlarged pores. Section 1, 17–50 cm, is comprised of white (10YR 8/2) ALGAL CORAL BOUNDSTONE. Laminar coral colonies usually form a network and are encrusted by red algae (cm-thick planar and branched crusts of corallinaceans). The "matrix" is made of fine-grained packstone with larger foraminifers (orbitoids), small bivalves and fragments of red algae and calcareous sponges (chaetetids).</p> <p>General Description:</p> <p>Rollers: Section 1, 0–11 cm and 41–50 cm. Drilling pebbles: Section 1, 11–41 cm.</p>

874B-8R 1



874B-6R CORED 47.6 - 57.2 mbsf

Meter	Graphic Lith.	Section	Age	Calc. nanno.	Plank. foram.	Larger foram.	Structure	Disturb.	Sample	Color
		1	Maastrichtian						T	10YR 8/2
		2		B	B	F,P			T	

874B-7R CORED 57.2 - 66.9 mbsf

Meter	Graphic Lith.	Section	Age	Calc. nanno.	Plank. foram.	Larger foram.	Structure	Disturb.	Sample	Color
		1	Maastrichtian							10YR 8/3
				B	B	C,P			T	

874B- 8R CORED 66.9 - 76.6 mbsf

Meter	Graphic Lith.	Section	Age	Calc. nanno.	Plank. foram.	Larger foram.	Structure	Disturb.	Sample	Color
		1	Maastrichtian							10YR 8/2
				B	B	C,M				

SITE 874 HOLE B CORE 9R

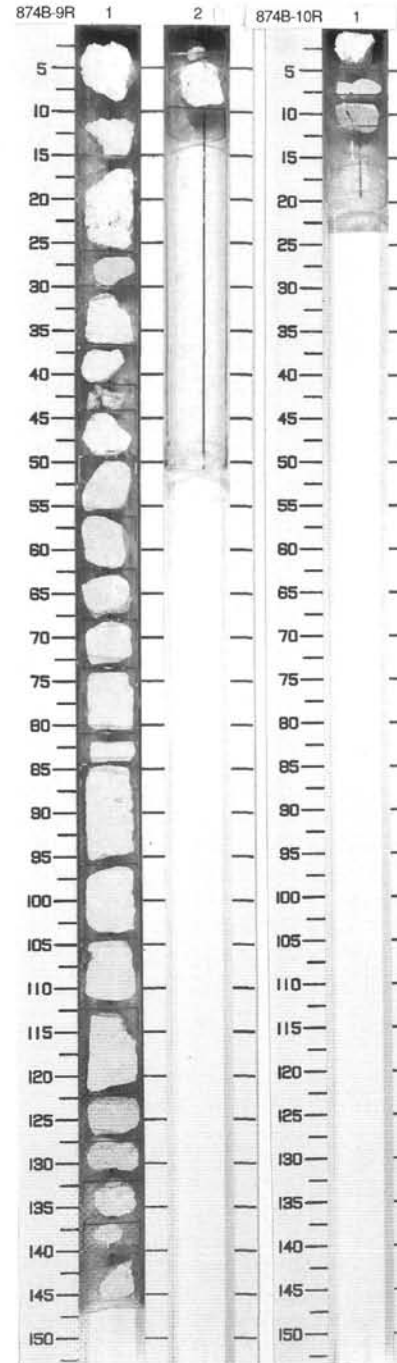
CORED 76.6 – 86.2 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	DESCRIPTION
1		1	Maastrichtian			T	10YR 8/2 To 10YR 7/3	<p>and is mostly interparticle. Section 1, 49–104 cm, is comprised of a very pale brown (10YR 7/3) RHODOLITH RUDSTONE; the matrix of this rudstone is recrystallized. Rhodoliths are common, especially in Section 1, 49–56 cm, 62–68 cm, and 68–73 cm. Rhodoliths range in size from 0.5 cm to 2 cm in diameter. This rudstone also includes many benthic foraminifers and fragments of red algae and bivalves; coral fragments are few. Porosity averages 10%; it is mostly moldic with some solution-enlarged interparticle pores. Porosity is moderately reduced by calcite cement. Section 1, 104–147 cm, and Section 2, 0–9 cm, consist of white (10 YR 8/2) SKELETAL GRAINSTONE, with abundant large benthic foraminifers (especially orbitoids in Section 1, 104–112 cm), many red algae, and bivalve fragments. Rhodoliths are observed in Section 1, 132–137 cm. The rock fabric is highly leached. Porosity averages 20% and is mostly solution enlarged interparticle and microvuggy. Intergranular cement is scarce.</p> <p>DESCRIPTION</p> <p>SKELETAL GRAINSTONE and RHODOLITH RUDSTONE</p> <p>Major Lithologies: Section 1, 0–49 cm, consists of a white (10YR 8/2), poorly cemented, SKELETAL GRAINSTONE. This grainstone is generally well sorted and fine to medium grained, except in Section 1, 8–15 cm, where there are algal nodules; average is 3 cm in diameter. Components include common to abundant benthic foraminifers (miliolids, orbitoids), fragments of red algae (corallinaceans) and corals. The porosity in this grainstone averages 20%–25%.</p> <p>General Description: Cylinders: Section 1, 15–26 cm, 73–81 cm, and 84–122 cm. Rollers: Section 1, 0–15 cm, 30–36 cm, 44–73 cm, and 122–127 cm; Section 2, 3–9 cm. Drilling pebbles: Section 1, 26–30 cm, 36–44 cm, 81–84 cm, and 127–144 cm; Section 2, 0–3 cm. Thin section sample: Section 1, 99–101 cm.</p>

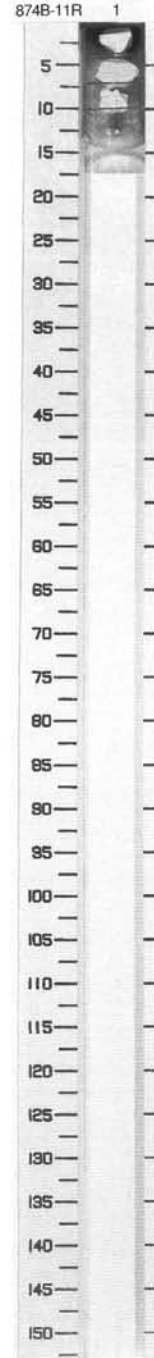
SITE 874 HOLE B CORE 10R

CORED 86.2 – 91.2 mbsf

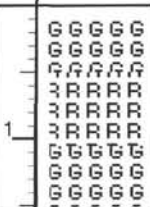

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	DESCRIPTION
		1	Maastrichtian			T	10YR 8/2	<p>DESCRIPTION</p> <p>SKELETAL PACKSTONE and SKELETAL GRAINSTONE</p> <p>Major Lithologies: Section 1, 1–5 cm, consists of a white (10YR 8/2) SKELETAL PACKSTONE with corals, calcareous sponges (chaetetids), and minor fragments of radiolitic rudists. The porosity is moldic and vuggy; it averages 3%. Section 1, 5–8 cm, is comprised of a white (10YR 8/2), fine-grained and well-sorted, SKELETAL GRAINSTONE. This grainstone includes fragments of red algae (15%), larger foraminifers and minor fragments of rudists and casts of bivalves. Most of the grains are unidentifiable. Vugs are lined by isopachous dog tooth sparry calcite stained yellow by limonite. Section 1, 8–11 cm, is a white (10YR 8/2), 5 cm-long coral piece enclosing boring bivalves; some of the intraskeletal voids are lined by coarser drusy calcite cement-stained yellow (by limonite?).</p> <p>General Description: Drilling pebbles: Section 1, 0–11 cm. Thin section sample: Section 1, 5–7 cm.</p>



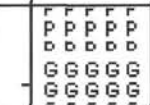

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	DESCRIPTION
	P P P P P P P P P P P P P P P P	1		☉		-	10YR 8/2	<p>DESCRIPTION</p> <p>SKELETAL PACKSTONE</p> <p>Major Lithology: Section 1, 0–4 cm, consists of a coral colony with attached white (10 YR 8/2) SKELETAL PACKSTONE. In the coral are few boring bivalves. The vuggy porosity averages 2%, with dogtooth sparry calcite lining voids. The rock has been chalkified with the resulting obliteration of the packstone composition. Section 1, 4–7 cm, is comprised of a white (10YR 8/2) coral colony enclosed within coarse-grained SKELETAL PACKSTONE. Recognizable, are grains of bivalves which were leached out (10%), rare fragments of rudists, red algae fragments, and benthic foraminifers; finer particles are unidentifiable. This packstone is chalkified. The vuggy porosity is minor. Section 1, 7–10 cm, is a fragment of coral in a skeletal packstone.</p> <p>General Description: Drilling pebbles: Section 1, 0–10 cm. Thin section sample: Section 1, 1–3 cm.</p>
<p>Maastrichtian</p>								





874B-9R CORED 76.6-86.2 mbsf

Meter	Graphic Lith.	Section	Age	Calc. nanno.	Plank. foram.	Larger foram.	Structure	Disturb.	Sample	Color
1 2		1	Maastrichtian	B	B	C.M			T	10YR 8/2 To 10YR 7/3
		2								



874B-10R CORED 86.2-91.2 mbsf

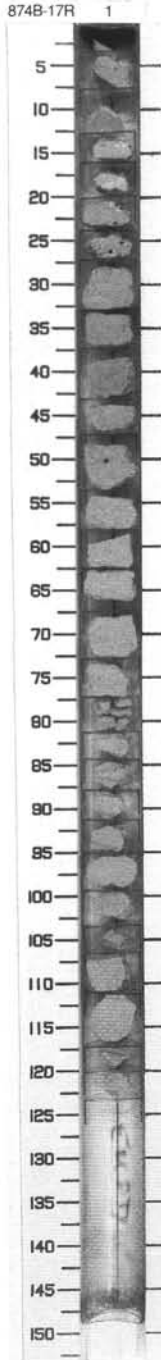
Meter	Graphic Lith.	Section	Age	Calc. nanno.	Plank. foram.	Larger foram.	Structure	Disturb.	Sample	Color
		1	Maastrichtian	B	B	Maastrichtian			T	10YR 8/2
						F.P				

874B-11R CORED 91.2-96.2 mbsf

Meter	Graphic Lith.	Section	Age	Calc. nanno.	Plank. foram.	Larger foram.	Structure	Disturb.	Sample	Color
		1		B	B	F.P			T	10YR 8/2

Maastrichtian


Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	DESCRIPTION
1		1	Maastrichtian	(V)		T T	5YR 7/8	<p>SKELETAL GRAINSTONE</p> <p>Major Lithology: Section 1, 0–123 cm, consists of SKELETAL GRAINSTONE, yellow (10YR 7/8) in the first 8 cm, then reddish yellow (5YR 7/8), with some yellow mm to cm-scale laminations. Low-angle cross lamination occurs in Section 1, 47–53 cm. Grains are medium sand size and mostly unrecognizable due to extensive recrystallization and/or coating with cement. Rounded fragments of red algae (some branching) and common larger foraminifers (Sulcoperculina and orbitoid forms) are present. In Section 1, 23–27 cm, there is a (1 cm) rhodolith that is extensively leached. Other irregular, white, platy fragments may be pieces of spalled rhodolith. Porosity is 40%–50%, including intergranular, moldic and vuggy. Intergranular cement is sparse; no crystal boundaries are visible. Several subspherical vugs, up to 0.5 cm in diameter, look like trapped air bubbles but do not seem to have the classic keystone vug shape. One large vug is broken open in Section 1, 23–27 cm; there is a half exposed orbitoid foraminifer protruding into the vug, and the vug is lined with a finely bladed calcite crust. Other such vugs have no lining. In Section 1, 0–8 cm, porosity and grain size, marginally, are higher; occasional calcite crystals are larger than 0.25 mm.</p> <p>General Description: Cylinders: Section 1, 32–77 cm. Rollers: Section 1, 27–32 cm, 91–99 cm, and 107–118 cm. Drilling pebbles: Section 1, 0–27 cm, 77–91 cm, 99–107 cm, and 118–123 cm. Thin section samples: Section 1, 24–27 cm and 27–33 cm.</p>

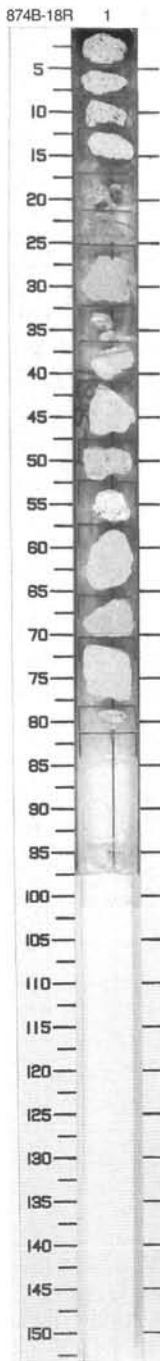


SITE 874 HOLE B CORE 18R

CORED 136.0 – 143.5 mbsf

874B-18R 1

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	DESCRIPTION
			Maastrichtian			T	10YR 8/3	<p>SKELETAL GRAINSTONE</p> <p>Major Lithology: Section 1, 0–12 cm, consists of a very pale brown (10YR 8/3), poorly cemented, medium-grained SKELETAL GRAINSTONE with red algae, larger foraminifers, and mostly unidentified grains. Some platy, clear grains may be recrystallized bivalve fragments. Porosity is 20%–30%, mostly intergranular; grains are rounded. Section 1, 12–21 cm, is comprised of SKELETAL GRAINSTONE. Similar composition as Section 1, 0–12 cm, but grains are smaller and cement is more abundant. Moldic porosity is similar to that reported in Section 1, 0–12 cm. Section 1, 21–82 cm, consists of a SKELETAL GRAINSTONE. The color is very pale brown (10YR 8/3) with just a hint of delicate salmon pink in several pieces. Overall lithology is fine-grained grainstone, similar in composition to coarser grained grainstone in Section 1, 12–21 cm, except that larger foraminifers are few (or fragmented). Section 1, 21–25 cm and 36–41 cm, include 1–1.5 cm rhodoliths; most coarser grained components are chalky and not recognizable. Some large (2–3 cm) pelecypods molds are observed in Section 1, 21–25 cm. Moldic and vuggy porosity averages 5%–20% (variable); bladed calcite crusts line molds. Pink cement increases at the base.</p> <p>General Description: Cylinders: Section 1, 58–65 cm and 70–79 cm. Rollers: Section 1, 0–17 cm, 21–32 cm, 36–58 cm, and 65–70 cm. Drilling pebbles: Section 1, 17–21 cm, 32–36 cm, and 79–82 cm. Thin section sample: Section 1, 17–21 cm, 52–57 cm, and 70–78 cm.</p>
						T		
						T		



Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color
1		1	late Campanian	Ⓟ	—	T T T T	10YR 7/3

DESCRIPTION

SKELETAL GRAINSTONE AND PACKSTONE

Major Lithology:

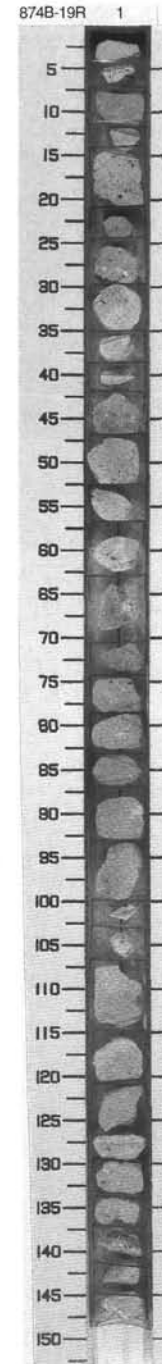
Section 1, 0–145 cm, consists of SKELETAL GRAINSTONE and clean PACKSTONE, throughout. Subtle differences in color and composition are used in subdividing these facies. Section 1, 0–4 cm, (probable caving) is comprised of very pale brown (10YR 7/9) SKELETAL GRAINSTONE. This grainstone is fine sand size (1/8-1/4 mm) and well sorted. Grains are largely of unknown composition, owing to small size, rounding, and leaching. This grainstone includes fragments of red algae and mollusks, and possible peloids. Porosity averages 30%, with small molds (smsMO). Cements consist of bladed calcite crusts. Section 1, 4–7 cm, (possible caving) is a very light brown (10 YR 8/4) rhodolith; red algae, both coralline (inner cortex) and squamariacean (outer cortex) coat a probable small coral head, and incorporate skeletal wackestone between laminae. The wackestone contains larger foraminifers, fragments of encrusting foraminifers and/or worms and gastropod molds. Porosity is 25% and is mostly moldic, especially in the "coral". Section 1, 7–29 cm, consists of a SKELETAL PACKSTONE AND (probably) GRAINSTONE. The color is white (10YR 8/2), but the core is pervasively although patchily, stained yellow (10YR 7/6 to 10YR 7/8). Yellow stains appear in vugs throughout the core, but are much less pervasive below Section 1, 29 cm. Grains are coarse-sand size (1/2–1 mm, 0–1 mm in diameter) on average, with many coarser grains. Skeletal components include, in approximate descending order: larger foraminifers, red algal fragments, small benthic foraminifers (including miliolids), corals, gastropod molds, and echinoderm fragments. Small rhodoliths (about 5 mm in diameter) and pellets are observed in Section 1, 24–29 cm. Section 1, 11–14 cm, includes a lined burrow, i.e. a ring of fine to sand grains. Section 1, 20–24 cm, is entirely a laminated coral, heavily bioeroded,

including a boring with a pholad bivalve inside, that is filled with skeletal sand. In this skeletal packstone and grainstone, the porosity is moldic and ranges from 10% to 25%, with an average of 15%. Section 1, 29–121 cm, consists of a SKELETAL- RHODOLITH GRAINSTONE AND PACKSTONE. The color is very pale brown (10YR 7/4), with yellow stains (10YR 7/6) in solution pores. Grain size is very coarse sand (1–2 mm) with some coarse and medium-sand intervals; the sorting is poor. In Section 1, 47–52 cm, there is apparent interlayering; the grainstone grades up into the packstone, which is overlain in sharp contact with a grainstone. Skeletal components include, in decreasing order: rhodoliths; larger foraminifers; fragments of encrusting foraminifers and worms; red algal fragments (squamariacians); green algae (dasycladaceans); mollusk fragments (radiolittid rudists); and calcareous sponges (chaetetids). In Section 1, 38–41 cm, brown, clear grains are phosphorite. Rhodoliths are especially formed by squamariacean red algae, with minor encrusting worms and corals. The sediment incorporated within the cortex of rhodoliths is finer than the adjacent sand (i.e. silt to fine sand). Rhodoliths occur throughout Section 1, 29–121 cm; their maximum size is 0.5 mm. Squamariacean algae form many large plates (to 2 mm-thick and tens of millimeters-long) in the sediment; these are probably fragments, which were broken from the rhodoliths. Identification was confirmed in thin section (from Section 1, 70–73 cm). A caprinid rudist with profuse circular canals (in a wall 7 mm-thick, with a projected inside diameter of 35 mm) occurs in Section 1, 41–47 cm. An encrusting coral, with a minimum length of 45 mm, is observed in Section 1, 120–121 cm. The dasycladacean algae are molds, which commonly preserve the architecture through calcite cement fillings of fine structures. Dasycladaceans are 2.0–2.5 mm in diameter and may be more than 5 mm-long, although many appear to be 3 mm-long oblate spheroids. They have a small, hollow central axis with perpendicular radiating tubes, that typically divide once or twice into conically radiating bundles of smaller tubes, toward the margins. The porosity of the skeletal-rhodolith grainstone and packstone varies irregularly between 2% and 15%; average is 6%. Porosity is mostly moldic, but calcite cement reduces pores formed by arches within the rhodoliths. Solution enlarged interparticle pores are significant in Section 1, 38–41 cm. Some of the rollers that were recovered, have faces that are stained yellow, or are coated by crusts of oriented calcite crystals. These are clearly the margins of vugs, or solution-enlarged fractures, which represent a large-scale porosity than can be recovered in these small diameter cores. The dimensions of the stained facets, which are a minimum estimate of pore size, are up to 50 mm. In some cases, up to 4 facets



occur on a single piece, thus indicating numerous surrounding vugs (e.g. Section 1, 56–70 cm, 100–107 cm, and 126–130 cm); this may also help to explain the poor recovery. In Section 1, 100–103 cm, two vugs are partially filled with light pale brown, lime mudstone. Yellow-stained bladed crusts of calcite cement (PB5C) overlie the sediment. Visible cement consists of crusts of medium to coarsely crystalline bladed calcite (PB4-5C) in solution pores (typically stained) and intragranular pores. Section 1, 121–145 cm, is comprised of very pale brown (10YR 8/4) FORAMINIFER PACKSTONE. Grain size is coarse sand (0.5–1 mm) and the sorting is poor to moderate. Mud content (<20 µm particles) is estimated as 10% in Section 1, 134–141 cm, but less elsewhere; there is a minimum (1%??) in Section 1, 130–134 cm. Skeletal components include, in decreasing order: larger foraminifers, red algae (corallinaceans, squamariaceans), green algae (dasycladaceans), rhodoliths (to 25 mm in diameter), sponges (e.g. Section 1, 126–130 cm and 134–137 cm, including chaetetids), and gastropods. Yellow grains, presumed to be phosphorite, comprise up to 10% of the grains in Section 1, 121–126 cm. The sponges that were identified, are calcite-filled molds of probable calcareous (aragonitic?) sponges, which are preserved by the fine-sediment infilling of tubular pores. They appear to form mats. In Section 1, 126–130 cm, a sponge bifurcates into layers that extend across the cores (60 mm maximum dimension). In Section 1, 134–137 cm, a sponge encloses a boring bivalve (12 mm-long). A nautiloid cephalopod (larger than core diameter) was cored in Section 1, 137–141 cm. Porosity is variable and ranges from 1% (inside the nautiloid) to 15% in Section 1, 121–126 cm; average is 6%. Porosity is mostly moldic (skeletal molds), but solution-enlarged interparticle (sxBP) is greater than moldic porosity in Section 1, 121–126 cm. Interparticle porosity, solution enlarged, is noteworthy in Section 1, 130–134 cm (sxBP; 8% total diameter). Vugs occur adjacent to some recovered pieces; 3 or 4 vugs create facets 25–45 mm across in Section 1, 126–130 cm; they virtually circumscribe the piece. Visible porosity is limited to crust of equant, medium crystalline calcite (PE4C).

General Description:

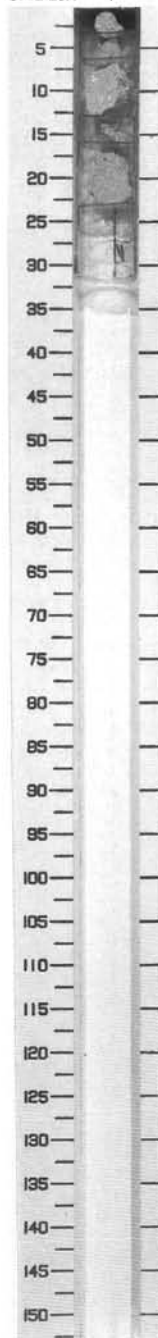
Cylinders: Section 1, 14–20 cm, 93–100 cm, and 107–115 cm. Rollers: Section 1, 0–14 cm, 24–35 cm, 41–93 cm, and 115–150 cm. Drilling pebbles: Section 1, 20–24 cm, 35–41 cm, and 100–107 cm. Thin sections: Section 1, 11–13 cm, 34–38 cm, 70–73 cm, 99–102 cm, 120–125 cm, and 133–137 cm.



SITE 874 HOLE B CORE 20R CORED 153.1 – 162.8 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	DESCRIPTION
		1	Maastrichtian			T T	10YR 8/3	<p>FORAMINIFER ALGAL GRAINSTONE AND PACKSTONE</p> <p>Major Lithology: Section 1, 1–22 cm, is comprised of very pale brown (10YR 8/3), coarse-grained FORAMINIFER-ALGAL GRAINSTONE, which enclose large fragments and colonies of corals. Coral fragments are up to 3 cm in size, some have their surface encrusted by red algae. Commonly, boring bivalves are observed in the coral. The grainstone is composed of orbitoids, fragments of red algae (corallinaceans), rudist fragments, rare small bivalves and small gastropods, and unidentifiable grains. Inter- and intraparticle porosity is minor and averages 5%. A fragment of rhodolith, with multiple layers of red algae coating coral, is observed in a very porous matrix in Section 1, 3–5 cm. The packstone between the algal layers is stained yellow by iron hydroxide. In Section 1, 15–22 cm, 8 or more tubes or cylinders of carbonate sand grains are interpreted as constructed burrows. They have sharp inner boundaries (4–5 mm in diameter) and vaguer outer boundaries (about 9 mm in diameter). They are at least 20 mm long (from elongation on cut surface) to perhaps 40 mm (by projection through the piece). Elongation is horizontal, judging from probable geopetal sand fillings. An hemispherical termination of one tube is visible on the working half. The tubes are conspicuous, because of contrasts in the size and packing of skeletal sand grains in the tubes and those in the matrix, and because of slightly greater lithification in the tubes. The sand grains are more densely packed and finer (fine sand) in the tubes, than in the surrounding and filling matrix (coarse sand, 0.5–1 mm). The tubes are judged to be in situ because the outer boundaries are somewhat vague; they do not appear to be abraded, encrusted, or stained. Geopetal structures, inferred from slight gaps between infilling sand and the walls, are consistent (note however that the fill could postdate erosion and redeposition). Spacing appears uniform among the tubes. They are separated by 3 to 5 mm or more. This may be illusory, because the cross sections and exterior exposures indicate that they are not precisely parallel, although there may be a preferred elongation. The tubes are interpreted as being burrows or dwellings, formed of selected sand grains that were biologically impregnated or cemented. The apparent horizontal orientation is puzzling, if the tubes are indeed in situ, because the inhabitants were probably filter feeders in stationary dwellings that would have needed contact with the surface.</p> <p>General Description: Rollers: Section 1, 5–13 cm and 15–22 cm. Drilling pebbles: Section 1, 0–5 cm and 13–15 cm. Thin section samples: Section 1, 6–13 cm and 16–22 cm.</p>

874B-20R 1



874B-18R

CORED 136.0 -143.5 mbsf

Meter	Graphic Lith.	Section	Age	Calc. nanno.	Plank. foram.	Larger foram.	Structure	Disturb.	Sample	Color
		1	Maastrichtian	B	B	F,M		T		10YR 8/3
								T		
								T		

874B-19R

CORED 143.5 - 153.1 mbsf

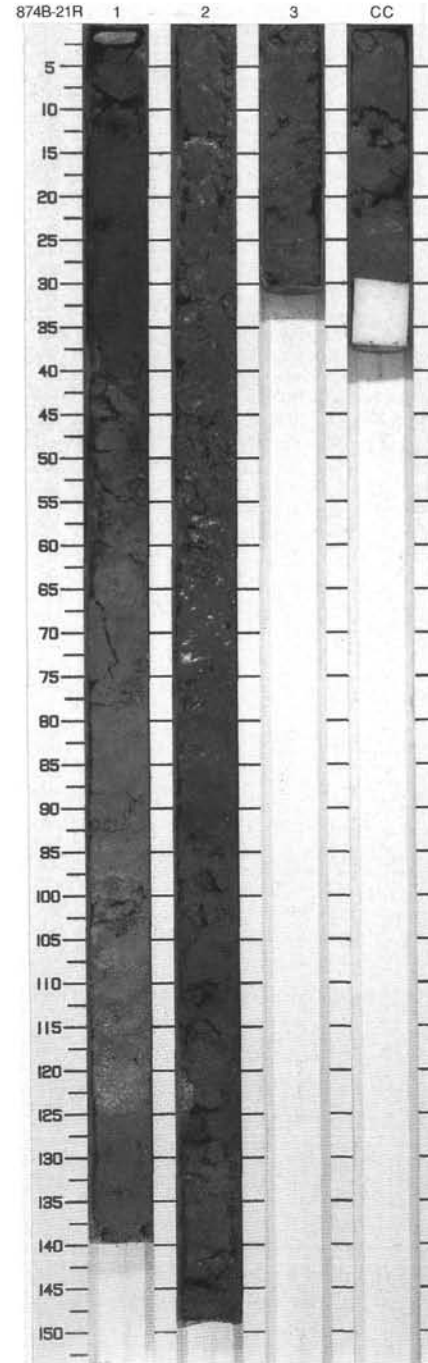
Meter	Graphic Lith.	Section	Age	Calc. nanno.	Plank. foram.	Larger foram.	Structure	Disturb.	Sample	Color
		1	? late Campanian	B	? late Campanian	C,M		T		10YR 7/3
								T		
								T		

874B-20R

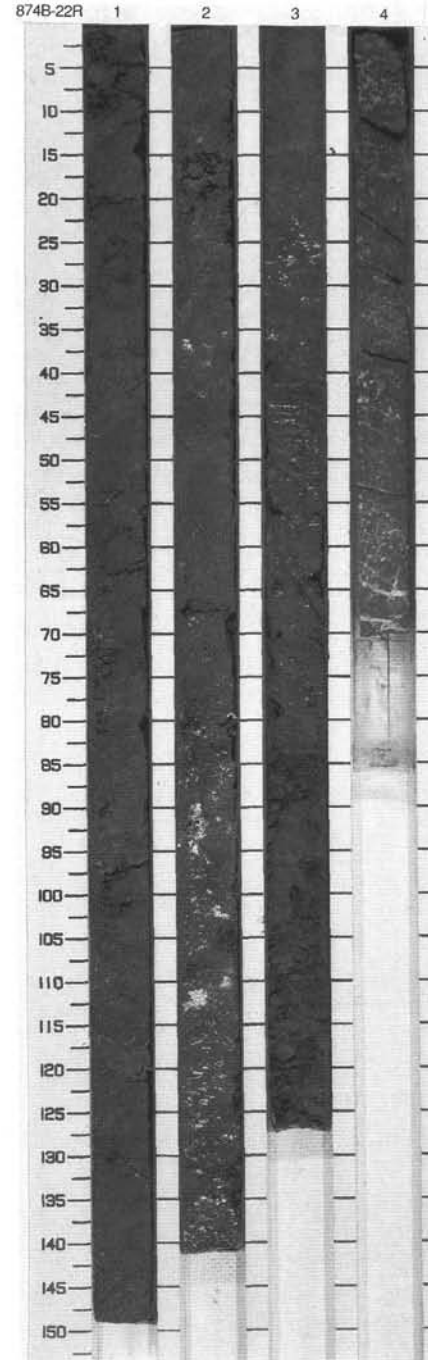
CORED 153.1 -162.8 mbsf

Meter	Graphic Lith.	Section	Age	Calc. nanno.	Plank. foram.	Larger foram.	Structure	Disturb.	Sample	Color
		1	? late Campanian	B	B	C,M		T		10YR 8/3
								T		
								T		


Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	DESCRIPTION	
1	[Dotted pattern]	1	Campanian				2.5Y 2/0 to 2.5 Y 5/0 to 10R 4/3	<p>CLAY, FORAMINIFER GRAINSTONE, and CLAYSTONE</p> <p>Major Lithologies: Section 1, 0–2 cm, consists of a rounded pebble of FORAMINIFER GRAINSTONE. The color is very pale brown (10YR 8/3), but the top pebble is yellow (10YR 8/8). This grainstone is bimodal. Most of the fine-grained skeletal grains are unidentifiable and include common tube-form fragments. Coarse grains (10%–15%), include well-preserved larger foraminifers (orbitoids) and traces of dasycladacean algae. Cement is limonite-stained microsparite. Section 1, 2–41 cm, is comprised of black (12.5Y 2/0), homogeneous CLAY. At Section 1, 41 cm, a 4 mm-thick laminae of large benthic foraminifers and rock fragments is observed. In Section 1, 41 cm, there is a drilling contact with gray (2.5Y 5/0) basalt highly altered into a clay. The vesicular texture of the basalt is visible and includes laths of plagioclase and vesicles infilled by zeolites. The matrix includes abundant small crystals of pyrite. The degree of alteration decreases downward. In Section 1, 125 cm, there is a sharp color boundary between light gray mottled clay and underlying weak red (10R 4/3) clay with white spots (5YR 8/1) representing altered zeolites. There is no compositional change across this boundary. Section 1, 125–140 cm, is comprised of CLAYSTONE. The color is weak red (10R 4/3), with small (1–2 mm) white (5YR 8/1) stains. The composition of the claystone is the same as in Section 1, 41–125 cm, but one of main ore minerals is Fe-oxide(?); the white stain is zeolites(?). The claystone represents altered vesicular basalt. Section 2, 0–150 cm, consists of MOTTLED CLAYSTONE. The color is dusky red (10R 3/1 to 3/4, and 10R 3/6) with white irregular zeolite veins (1–3 mm-thick). This mottled claystone includes a residual fabric of basalt. Section 3, 0–30 cm, is comprised of dusky red (10R 3/1 to 3/4) MOTTLED CLAYSTONE. This mottled claystone retains the fabric of the original basalt; it includes white zeolite patches (1–2 mm), after original plagioclase and vesicles. Section CC, 0–29 cm, is comprised of MOTTLED CLAYSTONE, that is similar to the mottled claystone observed in Section 3, 0–30 cm.</p>	
2	[Dotted pattern]	2							10R 3/1 to 3/4
3	[Dotted pattern]	3							
	[Dotted pattern]	CC							




Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	DESCRIPTION
1	[Dotted pattern]	1						<p>CLAYSTONE</p> <p>Major Lithology: Section 1, 0-150 cm, consists of MOTTLED CLAYSTONE, which mostly retains fabric of vesicular basalt (see, Section 2). The color is dusky red (10R 3/1 to 3/4), and mottled. Section 2, 0-77 cm, is comprised of MOTTLED CLAYSTONE which mostly retains the fabric of vesicular plagioclase microphyric basalt. This claystone includes 1-2 mm laths of plagioclase replaced by soft white zeolite, and vesicles less than 1 mm in size filled by zeolite. Section 1, 77-141 cm, consists of MOTTLED CLAYSTONE, which retains the fabric of the underlying ankaramite. Colors are as above, plus light olive brown (2.5Y 5/4). Horizontally elongate vesicles, about 2 cm x 5 mm and zeolite filled, may indicate a flow top. Section 3, 0-85 cm, is comprised of dusky red (10R 3/4) CLAYSTONE corresponding to insitu weathered ankaramite. Section 3, 24-30 cm and 43-55 cm, includes horizontally elongated patches of soft, white zeolite, that are 1-3 cm-long and 1-2 mm-thick. Section 3, 85-127 cm, consists of MOTTLED CLAYSTONE, disrupted by drilling. The color is dusky red (10R 3/4), with moderate yellowish green (10GY 6/4) patches (3-5 mm). This claystone includes 20% competent fragments (up to 3 cm) which retain the basalt fabric.</p>
2	[Dotted pattern]	2					10R 3/1 To 2.5Y 5/4	
3	[Dotted pattern]	?						
4	[Dotted pattern]	3						
5	[Dotted pattern]	4						



874B-21R CORED 162.8-172.4 mbsf

Meter	Graphic Lith.	Section	Age	Calc. nanno.	Plank. foram.	Larger foram.	Structure	Disturb.	Sample	Color
1		1	Campanian	Campanian → G	B	B			-	2.5Y 2/0 To 2.5Y To 5/0 To 10R 4/3
2		2								10R 3/1 To 3/4
3		3								
		C,C								

874B-22R CORED 172.4-177.7 mbsf

Meter	Graphic Lith.	Section	Age	Calc. nanno.	Plank. foram.	Larger foram.	Structure	Disturb.	Sample	Color
1		1								10R 3/1 To 2.5Y 5/4
2		2								
3		3								
4		4								
5				B	B	B				

144-874B-22R-4

UNIT 1: OLIVINE-CLINOPYROXENE BASALT (ANKARAMITE)

Piece 1

CONTACTS: Continues into 23R-1.

PHENOCRYSTS:

Clinopyroxene - 15%; 1-14 mm; Prisms to subrounded shapes, moderate yellow green (10GY 6/4). Completely altered above 33 cm; Partially altered below 33 cm.
 Olivine - 25%; 1-8 mm; Subhedral, fractured, dark red (10R 3/6) above 33 cm, strong brown (7.5YR 5/8) below 33 cm, pseudomorphs replaced by clay.

GROUNDMASS: Microcrystalline.

VESICLES: 5%; 3-10 cm; Irregular; 39-60 cm; Filled with clay or zeolite.

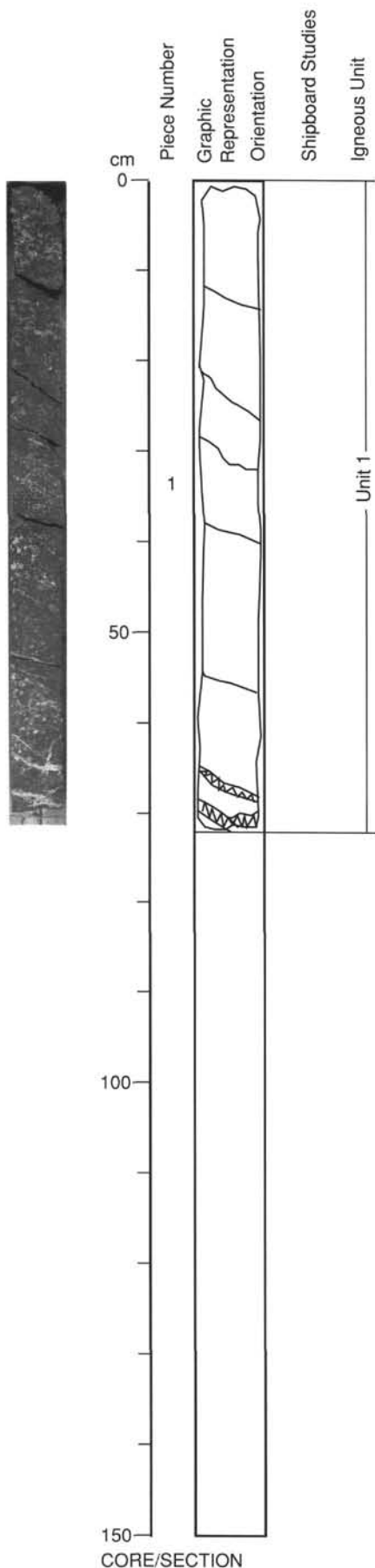
COLOR: Above 33 cm, reddish brown (2.5YR 4/4); Below 33 cm, dark grayish brown (2.5Y 4/2).

STRUCTURE: Massive.

ALTERATION: Colors indicate extensive alteration; Colors and hardness indicate extensive clay development.

VEINS/FRACTURES: 3%-10%; 1-30 mm; Subhorizontal; Filled with sparry calcite.

ADDITIONAL COMMENTS: None.



144-874B-23R-1

UNIT 1: OLIVINE-CLINOPYROXENE BASALT (ANKARAMITE) (continued)

Pieces 1-21

CONTACTS: Continues from 22R-4 and into 23R-2.

PHENOCRYSTS:

Clinopyroxene - 15%; 1-14 mm; Prisms to subrounded shapes, greenish black (5G 2/1). Minor clay replacement along fractures.
 Olivine - 25%; 1-8 mm; Subhedral, fractured, 5-69 cm dark yellowish brown (10YR 4/6) (mottled with white 10YR 8/1 above 30 cm), 69-114 cm mottled dark yellowish brown (10YR 4/4) and dark red (10R 3/6), 114-150 cm dark yellowish brown (10YR 4/6); Pseudomorphed by clay.

GROUNDMASS: Microcrystalline.

VESICLES: 5%; 3-10 cm; Irregular; 39-60 cm; Most in interval 39-60 cm, filled with clay or zeolite.

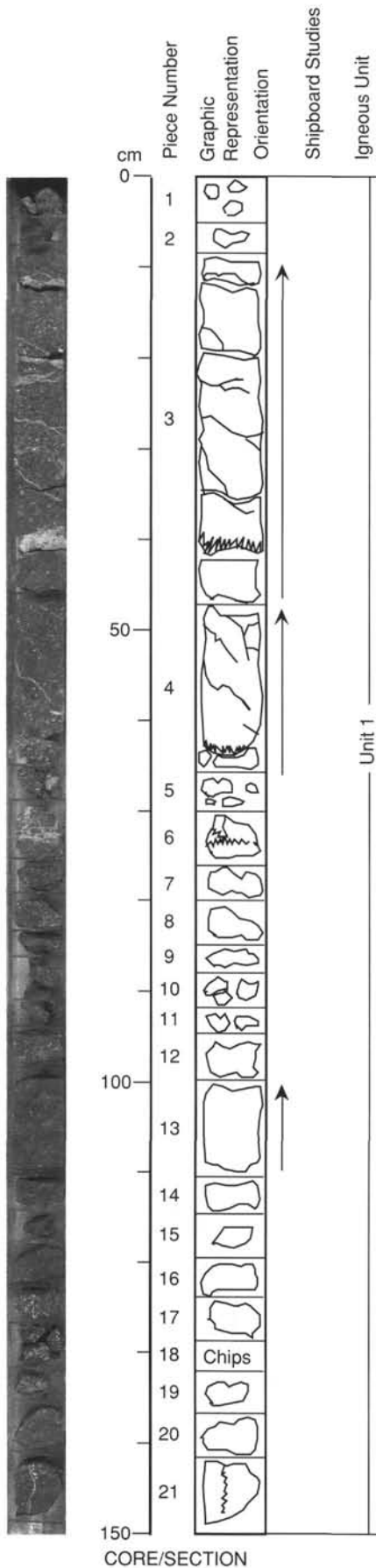
COLOR: 5-69 cm, olive gray (5Y 3/2); 69-122 cm, black (5Y 2.5/2); 122-136 cm, very dark gray (5YR 3/1); 136-150 cm olive gray (5Y 3/2).

STRUCTURE: Massive.

ALTERATION: Colors indicate extensive alteration; Colors and hardness indicate extensive clay development.

VEINS/FRACTURES: 3%-10%; 1-30 mm; Subhorizontal; Filled with sparry calcite. No veins below 75 cm.

ADDITIONAL COMMENTS: 0-5 cm is very dusky red (10R 2/2) claystone fragments.



144-874B-23R-2

UNIT 1: OLIVINE-CLINOPYROXENE BASALT (ANKARAMITE) (continued)

Pieces 1-24

CONTACTS: Continues from 23R-1 and into 23R-3.

PHENOCRYSTS:

Clinopyroxene - 15%; 1-14 mm; Prisms to subrounded shapes, greenish black (5G 2/1). Minor clay replacement along fractures.

Olivine - 25%; 1-8 mm; Subhedral, fractured; 0-31 cm, dark yellowish brown (10YR 4/6); 34-40 cm, olive (5Y 5/4); 40-104 cm, dusky red (10R 3/2) 104-150 cm, dusky red (10R 3/4); Pseudomorphed by clay.

GROUNDMASS: Microcrystalline.

VESICLES: 5%; 3-10 cm; Irregular; Filled with clay or zeolite.

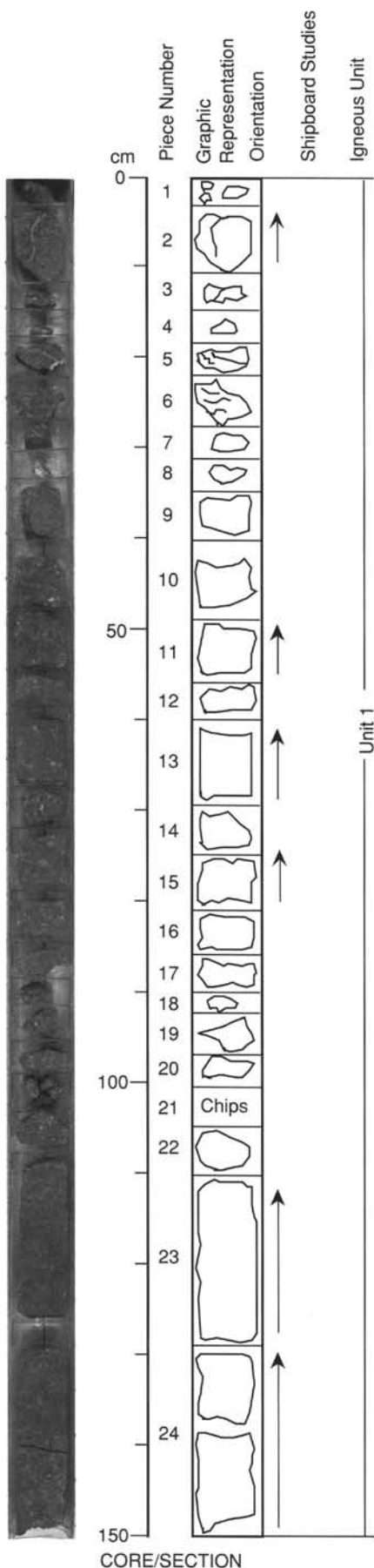
COLOR: 0-31 cm, black (5Y 2.5/2); 34-40 cm, dark gray (N4); 40-104 cm, dusky red (10R 3/2); 104-150 cm, dusky red (10R 3/4).

STRUCTURE: Massive.

ALTERATION: Colors indicate extensive alteration; Colors and hardness indicate extensive clay development. 138-146 cm, 10% areas were groundmass has been replaced by a translucent, well-developed, olive gray (5Y 5/2) phyllosilicate.

VEINS/FRACTURES: 3%-10%; 1-30 mm; Subhorizontal; Filled with sparry calcite. Veins in Pieces 3-6 are filled with yellow (10YR 7/6) clay.

ADDITIONAL COMMENTS: 104-150 cm the olivines, matrix, and vesicle-fillings are all dusky red (10YR 3/4), making them hard to distinguish.



CORE/SECTION

UNIT 1: OLIVINE-CLINOPYROXENE BASALT (ANKARAMITE) (continued)

Pieces 1-6

CONTACTS: Continues from 23R-2 and into 24R-1.

PHENOCRYSTS:

Clinopyroxene - 15%; 1-14 mm; Prisms to subrounded shapes, greenish black (5G 2/1). Minor clay replacement along fractures.

Olivine - 25%; 1-8 mm; Subhedral, fractured, dusky red (10R 3/3) and some are mottled with white (10YR 8/1); Pseudomorphed by clay.

GROUNDMASS: Microcrystalline.

VESICLES: 5%; 3-10 cm; Irregular; Filled with clay or zeolite.

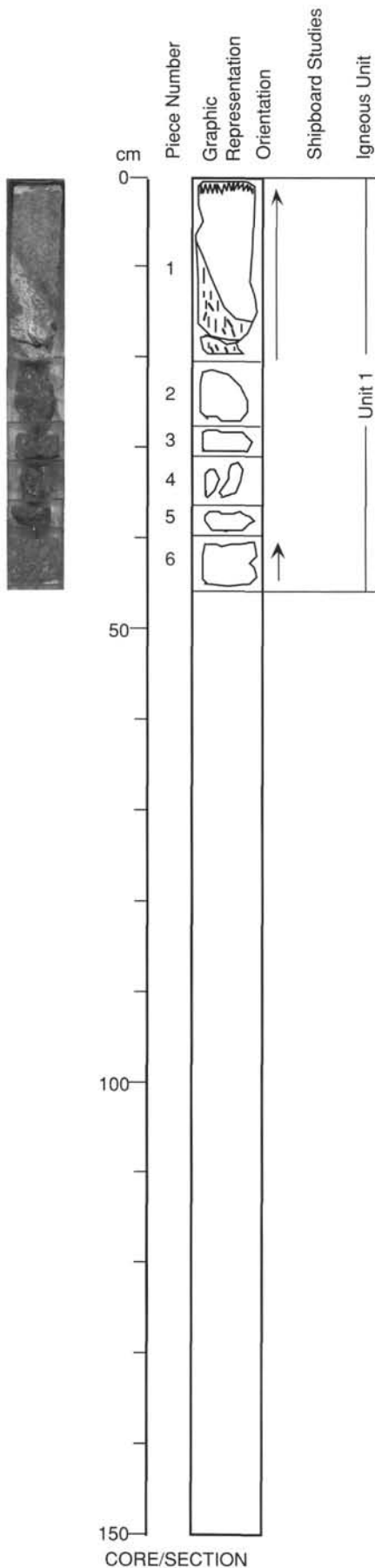
COLOR: Dark gray (N4).

STRUCTURE: Massive.

ALTERATION: Colors indicate extensive alteration; Colors and hardness indicate extensive clay development.

VEINS/FRACTURES: 3%-10%; 1-30 mm; Subhorizontal; Filled with sparry calcite. Lower portion of Piece 6 is a 6 cm vein of calcite which has replaced matrix, leaving small enmeshed fragments.

ADDITIONAL COMMENTS: None.



144-874B-24R-1

UNIT 1: OLIVINE-CLINOPYROXENE BASALT (ANKARAMITE) (continued)

Pieces 1-8

CONTACTS: Continues from 23R-3 and into 24R-2.

PHENOCRYSTS:

Clinopyroxene - 15%; 1-14 mm; Prisms and subrounded shapes, greenish black (5G 2/1). Below 78 cm, the clinopyroxene is more altered, changing to a moderate yellowish green (10GY 6/4).

Olivine - 25%; 1-8 mm; Subhedral, fractured, 0-78 cm dusky red (10R 3/3) and some are mottled with white (10YR 8/1), 78-143 cm dusky red (10R 3/3) and olive brown (2.5Y 4/4); Pseudomorphed by clay.

GROUNDMASS: Microcrystalline.

VESICLES: 5%; 3-10 cm; Irregular; Filled with clay or zeolite.

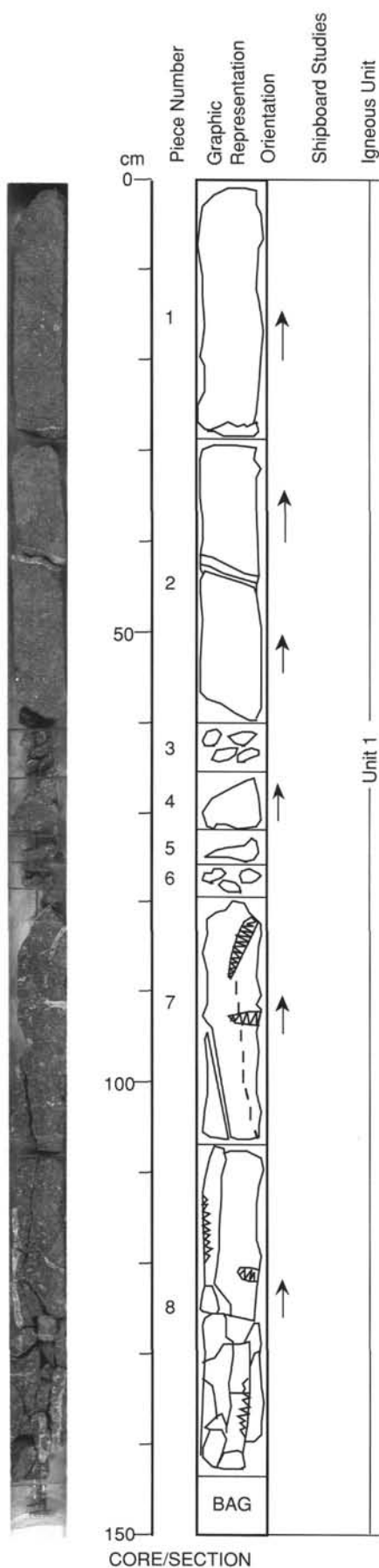
COLOR: 0-78 cm, dark gray (N4); 78-143 cm, very dark grayish green (10G 3/1) in the alteration halo.

STRUCTURE: Massive.

ALTERATION: Colors indicate extensive alteration; Colors and hardness indicate extensive clay development. Below 78 cm, an alteration halo has developed around a large vein.

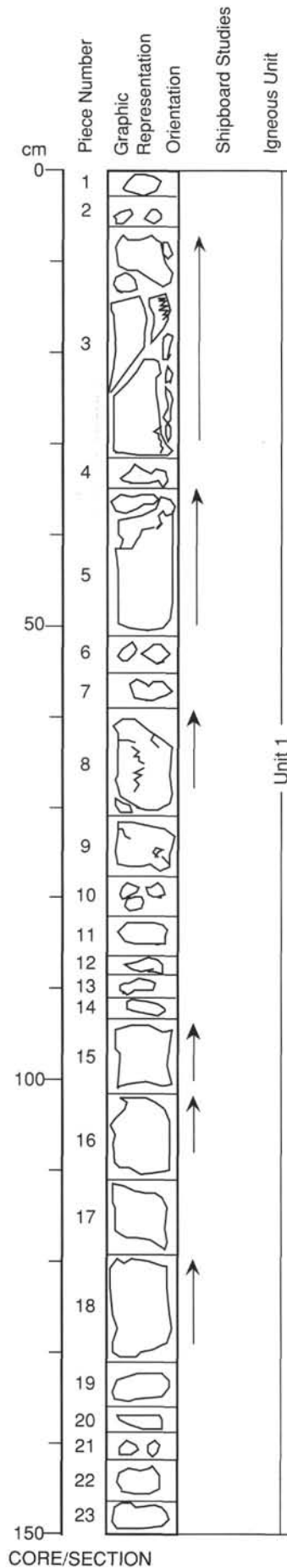
VEINS/FRACTURES: 3%-10%; 1-30 mm; Subhorizontal; Filled with sparry calcite. The large vein responsible for the alteration is best seen at 130-140 cm. It is lined with calcite, irregularly growing into a center of a very soft, dark greenish yellow (10Y 6/6) clay mineral.

ADDITIONAL COMMENTS: The contact zone (3 cm wide) has red to dark red (10R 4/6-3/6) olivines, and is crumbling apart.



UNIT 1: OLIVINE-CLINOPYROXENE BASALT (ANKARAMITE) (continued)

Pieces 1-23



CONTACTS: Continues from 24R-1 and into 24R-3.

PHENOCRYSTS:

Clinopyroxene - 15%; 1-14 mm; Prisms to subrounded shapes, moderate yellowish green (10GY 6/4). Quite altered.

Olivine - 25%; 1-8 mm; Subhedral, fractured, 78-143 cm dusky red (10R 3/3), olive brown (2.5Y 4/4), and dark greenish gray (5G 4/1), 78-136 cm dark red (10R 3/6), 136-150 cm strong brown (7.5YR 5/8); Pseudomorphed by clay.

GROUNDMASS: Microcrystalline.

VESICLES: 5%; 3-10 cm; Irregular; Filled with clay or zeolite.

COLOR: 0-78 cm, very dark grayish green (10G 3/1) in the alteration halo; 78-136 cm, dusky red (10R 3/3); 136-150 cm, dark gray (N3).

STRUCTURE: Massive.

ALTERATION: Colors indicate extensive alteration; Colors and hardness indicate extensive clay development. Above 78 cm, an alteration halo has developed around a large vein.

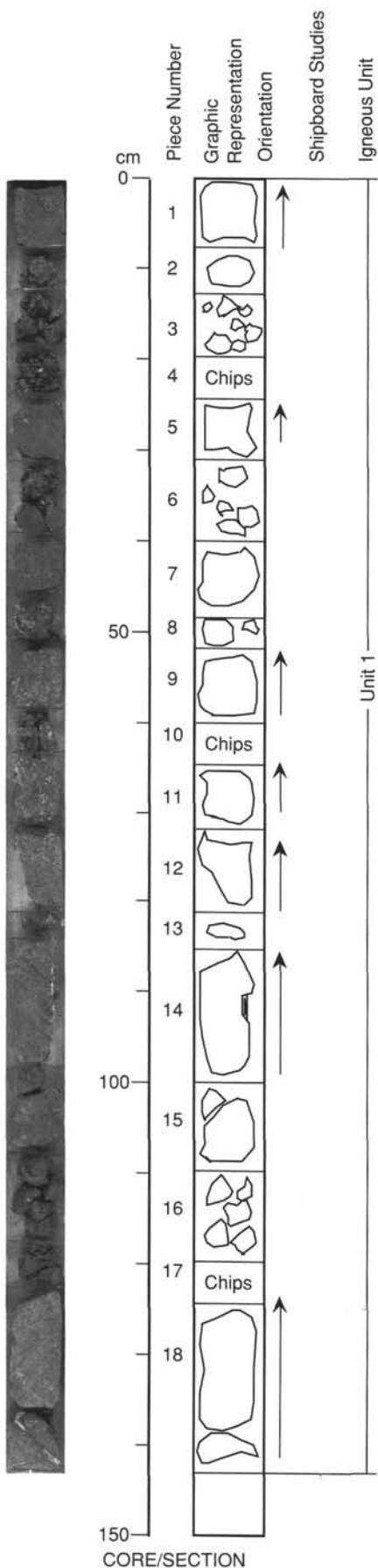
VEINS/FRACTURES: 3%-1%; 1-30 mm; Subhorizontal; Filled with sparry calcite. No veins between 78 and 136 cm. 136-150 cm, 2%, <3 mm, calcite veins and blotches.

ADDITIONAL COMMENTS: 0-78 cm the alteration halo (3 cm wide) has red to dark red (10R 4/6-3/6) olivines, and is crumbling apart.

144-874B-24R-3

UNIT 1: OLIVINE-CLINOPYROXENE BASALT (ANKARAMITE) (continued)

Pieces 1-18



CONTACTS: Continues from 24R-2 and into 24R-4.

PHENOCRYSTS:

Clinopyroxene - 15%; 1-14 mm; Prisms and subrounded shapes, moderate yellowish green (10GY 6/4). Quite altered. A little less altered in interval 123-144 cm.

Olivine - 25%; 1-8 mm; Subhedral, fractured, 0-72 cm iddingsitized to dark reddish brown (10R 3/4), 72-144 cm yellowish red (5YR 4/6); Pseudomorphed by clay.

GROUNDMASS: Microcrystalline.

VESICLES: None.

COLOR: 0-72 cm, moderate brown (5YR 3/4); 72-99 cm, medium gray (N5); 99-123 cm, dusky red (2/5YR 3/2); 123-144 cm, dark gray (5Y 4/1).

STRUCTURE: Massive.

ALTERATION: Colors indicate extensive alteration; Colors and hardness indicate extensive clay development.

VEINS/FRACTURES: <1%; 1-4 mm; Only below 72 cm. Calcite and a dark greenish yellow (5Y 5/6) clay.

ADDITIONAL COMMENTS: 0-72 cm is strongly altered and very soft. There are 5%, <3 mm, blotches of calcite replacing groundmass.

UNIT 1: OLIVINE-CLINOPYROXENE BASALT (ANKARAMITE) (continued)

Pieces 1-11

CONTACTS: Continues from 24R-3.

PHENOCRYSTS:

Clinopyroxene - 15%; 1-14 mm; Prisms and subrounded shapes, moderate yellowish green (10GY 6/4). A little less altered than previous.

Olivine - 25%; 1-8 mm; Subhedral, fractured, 1-103 cm yellowish red (5YR 4/6); Pseudomorphed by clay. Below 103 cm, some of the olivines appear fresh.

GROUNDMASS: Microcrystalline.

VESICLES: None.

COLOR: 0-103 cm, dark gray (5Y 4/1); 103-118 cm, dark gray (N3).

STRUCTURE: Massive.

ALTERATION: Colors indicate extensive alteration; Colors and hardness indicate extensive clay development.

VEINS/FRACTURES: None.

ADDITIONAL COMMENTS: None.

