

INITIAL CORE DESCRIPTIONS

DEEP SEA DRILLING PROJECT

LEG 30

SOUTHWEST PACIFIC



Prepared for the
NATIONAL SCIENCE FOUNDATION
National Ocean Sediment Coring Program
Under Contract C-482

By the
UNIVERSITY OF CALIFORNIA
Scripps Institution of Oceanography
Prime Contractor for the Project



SCRIPPS INSTITUTION OF OCEANOGRAPHY

POST OFFICE BOX 1529
LA JOLLA, CALIFORNIA 92037

Dear Colleague:

This document has been printed and distributed by the Deep Sea Drilling Project for the purpose of sample selection by interested earth scientists, sample requests being honored one year after completion of the cruise on which the samples were collected. It is an interim and informal document consisting of site data and sedimentologic and paleontologic data as known six (6) months post-cruise. These data, while completely adequate for almost all sample selection needs, will be subject to possible slight change by the time of issue of the formal cruise report, the corresponding volume of the Initial Reports of the Deep Sea Drilling Project.

The information contained herein is preliminary and privileged, consequently this document is not to be cited or used as the basis of other publications. Data cited or used in a manuscript will be considered a breach of professional ethics.

Thank you for your interest in the Deep Sea Drilling Project.

Sincerely,

A handwritten signature in cursive script that reads 'N. Terence Edgar'.

N. Terence Edgar
Chief Scientist
Deep Sea Drilling Project

NTE:eb

INITIAL CORE DESCRIPTION
(ICD)
DEEP SEA DRILLING PROJECT
LEG 30
APRIL 24, 73 - JUNE 13, 73

A Project Planned by and Carried Out With the Advice of the
JOINT OCEANOGRAPHIC INSTITUTIONS FOR DEEP EARTH SAMPLING (JOIDES)

MEMBER ORGANIZATIONS

Lamont-Doherty Geological Observatory, Columbia University
Rosenstiel School of Marine and Atmospheric Science, University of Miami
Scripps Institution of Oceanography, University of California
University of Washington
Woods Hole Oceanographic Institution
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INITIAL CORE DESCRIPTION - LEG 30

SYNOPSIS

The first drilling in the southwest Pacific island arc and marginal sea complex was carried out on Leg 21. Part of Leg 30 was devoted to the solution of problems raised on the earlier leg. Major objectives of Leg 30 included: (1) determination of ages and depositional histories of the South Fiji, New Hebrides and Coral Sea Basins; (2) determination of the age of the Ontong Java Plateau; and (3) obtaining of complete biostratigraphic zonation for the equatorial Pacific.

Five sites were drilled on the leg, with re-entry on one site (288). A total of 9 holes were drilled. Leg 30 departed from Wellington, New Zealand on 24th April 1973. The first site drilled was in the deepest part of the South Fiji Basin in a south-southeast trending basin of sediments. Drilling ended in a diabase sill intruded into middle Miocene volcanoclastic sediments. Profiles from the New Zealand shelf to the site and north from it revealed that the basin floor was much rougher than previously thought. The second site was located in the New Hebrides Basin at the foot of the slope down from Malekula in the New Hebrides in a region where the New Hebrides Trench is not developed. Volcanic basement was intruded by a gabbroic sill. The basement underlies a thick middle to late Eocene volcanoclastic sequence.

The third site drilled was 40 km from Site 210 on Leg 21. It was drilled on a structural high in the Coral Sea Basin. Volcanic basement was also reached at this site, it is overlain by early Eocene biogenic sediments.

The remaining two sites drilled were on the Pacific Plate. The first was on the eastern margin of the Ontong Java Plateau. The section there is characterized by reworking and slumping especially in the later Tertiary. Basement was not reached, the oldest sediments sampled were Aptian. The final site drilled was on the Ontong Java Plateau close to Site 64 of Leg 7. Continuous coring was carried out to obtain as complete a biostratigraphic sequence as possible. The sequence was unbroken to the early Oligocene and then discontinuous to the Aptian with six significant depositional breaks. Basalt basement was obtained below the Aptian sediments. The leg ended in Guam on 13 June 1973.

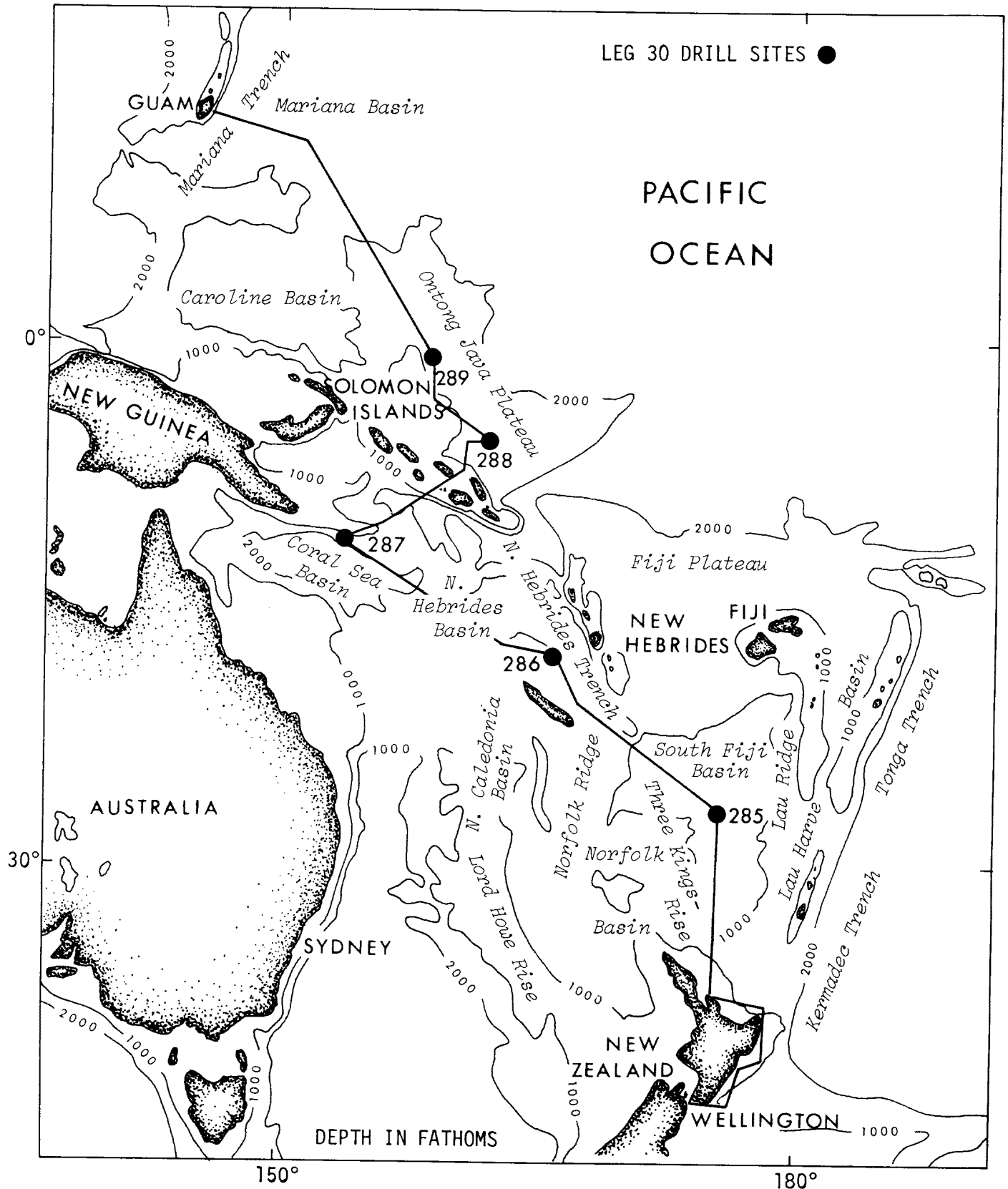


Figure 1. Location of Drill Sites, Leg 30, DSDP

EXPLANATORY NOTES

Numbering and Depth Conventions

A site number refers to a single hole or group of holes drilled in essentially the same position using the same acoustic beacon. The first hole at a site is given the number of the site. Second or subsequent holes drilled after withdrawing from the first hole and redrilling were labeled "A", "B", etc. holes (e.g. Hole 285A).

A core is taken by dropping a core barrel down the drill string and coring for 9.5 meters as measured by lowering of the drill string. The sediment is retained in a plastic liner 9.28 meters long inside the core barrel and in a 0.20 meter long core catcher assembly below the liner. The liner is not normally full.

On recovery the liner is cut into sections of 1.5 meters measured from the lowest point of sediment within the liner. In general the top of the core does not coincide with the top of a section. The sections are labeled from 1 for the top (incomplete) section to a figure as high as 6 for the bottom (complete) section, depending on the total length of core recovered. If the recovery is in excess of 9.0 meters the remaining top segment is designated the 0 section.

By convention, when partial recovery results, the recovered sediment is assumed to represent the top of the cored sequence. The core catcher represents sediment immediately below the lowest section.

An example of accepted convention for a sample number is "30-285-2-1 (10-20 cm)." The sample represents the interval between 10 and 20 centimeters in Section 1 of Core 2, Site 285, Leg 30.

Handling of Cores

After a core section has been cut, sealed, and labeled, it is brought into the core laboratory for processing. The routine procedure listed below was usually followed:

- 1) Weighing of the core section for mean bulk density measurement.
- 2) GRAPE analysis for bulk density and porosity.
- 3) Sonic velocity determination, using a Hamilton Frame.

After the physical measurements are made, the core is cut. One of the split halves is designated a working half. Samples, including those for grain size, X-ray mineralogy, water content, and carbon carbonate are taken. Larger samples are taken from suitable cores for inorganic and organic geochemical analysis. These samples are generally taken before the core is split.

The working half is then sent to the paleontology laboratory. There, samples for shipboard and shorebased studies of nannoplankton, foraminifera, radiolarians, diatoms, and silicoflagellates or other paleontological studies are taken.

The other half of a split section is designated an archive half. The color, texture, structure, and composition of the various lithologic units within a section are described on standard visual core description sheets (one per section) and any unusual features noted. A smear slide is made, usually at 75 cm if the core was uniform. Otherwise, two or more smear slides are made, each for a sediment of distinct lithology. The smear slides are examined microscopically. The archive half of the core section is then photographed. Both halves are sent

to cold storage onboard after they had been processed.

All samples are now deposited in cold storage at the DSDP East Coast Repository at Lamont-Doherty Geological Observatory and are available to investigators.

Sediment Analyses

Carbon Carbonate

Sediment samples are analyzed on a Leco 70-Second Analyzer following procedures outlined in Volumes 9 and 18 of the Initial Reports of the Deep Sea Drilling Project. Accuracy and precision of the results are as follows:

Total carbon	±0.3% (absolute)
Organic carbon	±0.06% (absolute)
CaCO ₃	±3% (absolute)

X-ray Mineralogy

Semiquantitative determinations of the mineral composition in bulk samples, 2 to 20 μ , and <2 μ fractions is performed according to the methods described in the reports of Legs 1 and 2 and in Appendix III of Volume IV, Initial Reports of the Deep Sea Drilling Project. The mineral analyses of the 2 to 20 μ and <2 μ fractions are performed on CaCO₃-free residues.

These are reported and shown on the core forms.

Amorphous scattering (Amor) is reported for some samples. This is the relative proportion of noncrystalline material present. The remaining crystalline percentage (Cryst) is summed to 100%.

Although minor quantities of unidentified minerals may be present, their concentration is not included in the concentrations of the

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identified minerals which are summed to 100%.

Grain Size

Sand-silt-clay distribution is determined on 10 cc sediment samples collected at the time the cores were split and described.

The sediment classification used here is that of Shepard (1954) with the sand, silt, and clay boundaries based on the Wentworth (1922) scale. Thus the sand, silt, and clay fractions are composed of particles whose diameters range from 2000 to 62.5 microns, 62.5 to 3.91 microns, and less than 3.91 microns, respectively.

Standard sieve and pipette methods were used to determine the grain size distribution. The sand-size fraction was removed by wet sieving using 63-micron sieve, and the silt and clay fractions were analyzed by standard pipette analysis. Sampling depths and volumes were calculated using equations derived from Stokes settling velocity equation (Krumbein and Pettijohn, 1938, 95-96).

Sediment Classification

A basic sediment classification was devised by O. E. Weser of DSDP and was first used at sea on Leg 18. The system has been reviewed and changed in-house several times, based upon experience gained during utilization at sea.

The complete DSDP sediment classification system follows.

Lithologic Symbols

Accompanying the introduction of the sediment classification to the DSDP volumes is the employment of a set of lithologic symbols (Figure 3). These symbols and their method of employment has continued,

with only minor modification, through all volumes subsequent to Volume 18. These symbols have been used on all core and site summary forms. Where complex lithologies occur, each major constituent is represented by a vertical bar. The width of each bar corresponds to the percentage value of the constituent it represents in the manner shown on Figure 2. It will be noted that the class limits of the vertical bars corresponds to those of the sediment classification. With this system of graphical representation, the rich portion of the major constituents and the minor constituents may be shown.

Shipboard Mineralogic-Lithologic Determination

Smear Slides

Smear slides are the basic means of mineral identification on shipboard. The shipboard party tried to be as specific as possible with regard to mineral identifications.

Smear slide estimates of mineral abundances were based on area of the smear slide covered by each component. Specific mineral identification and quantification was attempted for sands, but for silts and clays, only the textural categories were really quantified. Past experience has shown that accuracy may approach a percent or so for very distinctive minor constituents but that, for major constituents, accuracy of ± 10 to 20% is considered very good. Of more importance to the geologist than absolute accuracy are relative changes in component abundances.

A comment by shipboard sedimentologists is pertinent to this problem. The percentage of nannos was frequently overestimated in

CLASSIFICATION AND NOMENCLATURE RULES

I. Rules for class limits and sequential listing of constituents in a sediment name

A. Major constituents

1. Sediment assumes name of those constituents present in major amounts (major defined as >25%). See example in rule IA3.
2. Where more than one major constituent is present, the one in greatest abundance is listed farthest to the right. In order of decreasing abundance, the remaining major constituents are listed progressively farther to the left.
3. Class limits when two or more major constituents are present in a sediment are based on 25% intervals, thusly: 0-25, 25-50, 50-75, 75-100.

Example illustrating rules IA and IB and the resulting sediment names:

<u>% Clay</u>	<u>% Nannos</u>	
0-25	75-100	= Nanno ooze
25-50	50-75	= Clayey nanno ooze
50-75	25-50	= Nanno clay
75-100	0-25	= Clay

B. Minor constituents

1. At the discretion of the geologist, constituents present in amounts of 10-25% may be prefixed to the sediment name by the term **rich**.
Example: 50% nannofossils, 30% radiolarians, 20% zeolites would be called a **zeolite-rich rad nanno ooze**.
2. At the discretion of the geologist, constituents present in amounts of 2-10% may be prefixed to the sediment name by the term **bearing**.
Example: 50% nannofossils, 40% radiolarians, 10% zeolites would be called a **zeolite-bearing rad nanno ooze**.

C. Trace constituents. Constituents present in amounts of <2% may follow the sediment name with addition of the word **trace**. This again is at the discretion of the geologist.

II. Specific rules for calcareous and siliceous tests

- A. Nannofossil is applied only to the calcareous tests of coccolithophorids, discoasters, etc.
- B. The term **calcareous** or **siliceous**, depending on skeletal composition is applied where no attempt is made to distinguish fossils as to major subgroup. Thus, if no percent estimate is made, a mixture of radiolarians, diatoms, and silicoflagellates would be called **siliceous ooze**. Where this distinction is made, the appropriate fossil name is used.
- C. Fossil tests are not qualified by a textural term unless very obviously redeposited.
- D. Abbreviations, as nanno for nannofossil, rad for radiolarian, etc., may be used in the sediment name.
- E. The term **ooze** follows a microfossil taxonomic group whenever it is the dominant sediment constituent.
- F. Usage of the terms **marl** and **chalk** to designate amounts of microfossils, 30-60% and >60% respectively, as used by Olausson (1960) and others, is dropped. The term **chalk** is retained to designate a compacted calcareous ooze.

III. Clastic sediments

- A. Clastic constituents, whether detrital, volcanic, biogenous or authigenic, are given a textural designation. When detrital² grains are the sole clastic constituents of a sediment, a simple textural term suffices for its name. The appropriate term is derived from Shepard's triangle diagram (see Figure 3). The textural term can be preceded by a mineralogical term when this seems warranted. Such mineralogical terms are applied as per rules IA and B.

²Detrital = all clastic grains derived from the erosion of preexisting rocks except for those of biogenous, authigenic, or volcanic origin.

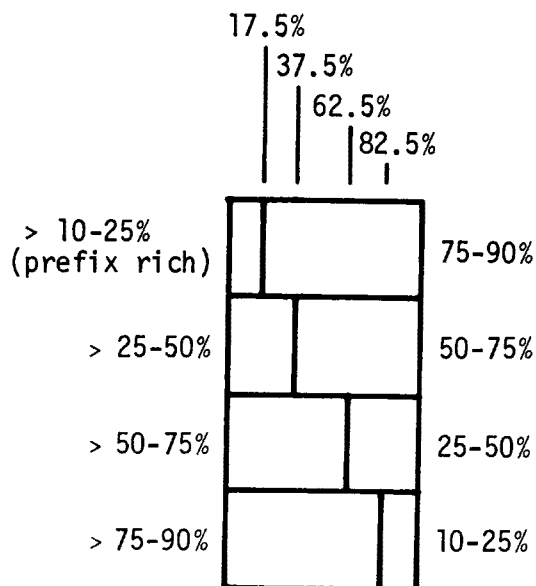


FIGURE 2 Vertical bar width representation of class limits.

- B. When the tests of a fossil biocoenosis or authigenic and detrital grains occur together, the fossil or authigenic material is not given a textural designation (as per rule IIC). However, the detrital material is classified texturally by recalculating its size components to 100%. With the presence of other constituents in the sediment, the detrital fraction now requires a compositional term.

C. Clastic volcanics

Redeposited pyroclastics also become a clastic component. They are again recognized by the term **volcanic** and receive a textural term such as **gravel**, **sand**, **silt**, etc. It is particularly difficult at times to differentiate between **volcanic sand** (i.e., transported by tractive mechanisms) and **crystal ash** (i.e., direct outfall resulting from explosion of a volcano).

D. Clastic authigenic constituents

Where authigenic minerals are recognized as being a redeposited constituent, they are given a textural designation in addition to their mineral names.

IV. Volcanic and authigenic constituents

A. Volcanic constituents

Pyroclastics are given textural designations already established in the literature. Thus, **volcanic breccia** = >32 mm, **volcanic lapilli** = <32 mm to >4 mm, and **volcanic ash** = <4 mm. It is at times useful to further refine the textural designations by using such modifiers as **coarse** or **fine**. An ash wholly, or almost wholly, of glass shards is termed **vitric ash**.

B. Authigenic constituents

1. Authigenic minerals enter the sediment name in a fashion similar to that outlined under rules IA and B. Normally, as with a fossil biocoenosis, the authigenic minerals are not given a textural designation and texture.
2. The terms **ooze** and **chalk** are applied to carbonate minerals of all types using the same rules that apply to biogenous constituents.

V. Color

- A. Color is not formally part of the sediment name. However, its employment for sediment description is important particularly as it provides one of the criteria used to distinguish **pelagic** and **terrigenous** sediments.
- B. Common usage dictates that it is no longer expedient to employ the term **red** for sediments (*usually* pelagic) which are various shades of red, yellow, and brown. The proper color designation should be used.

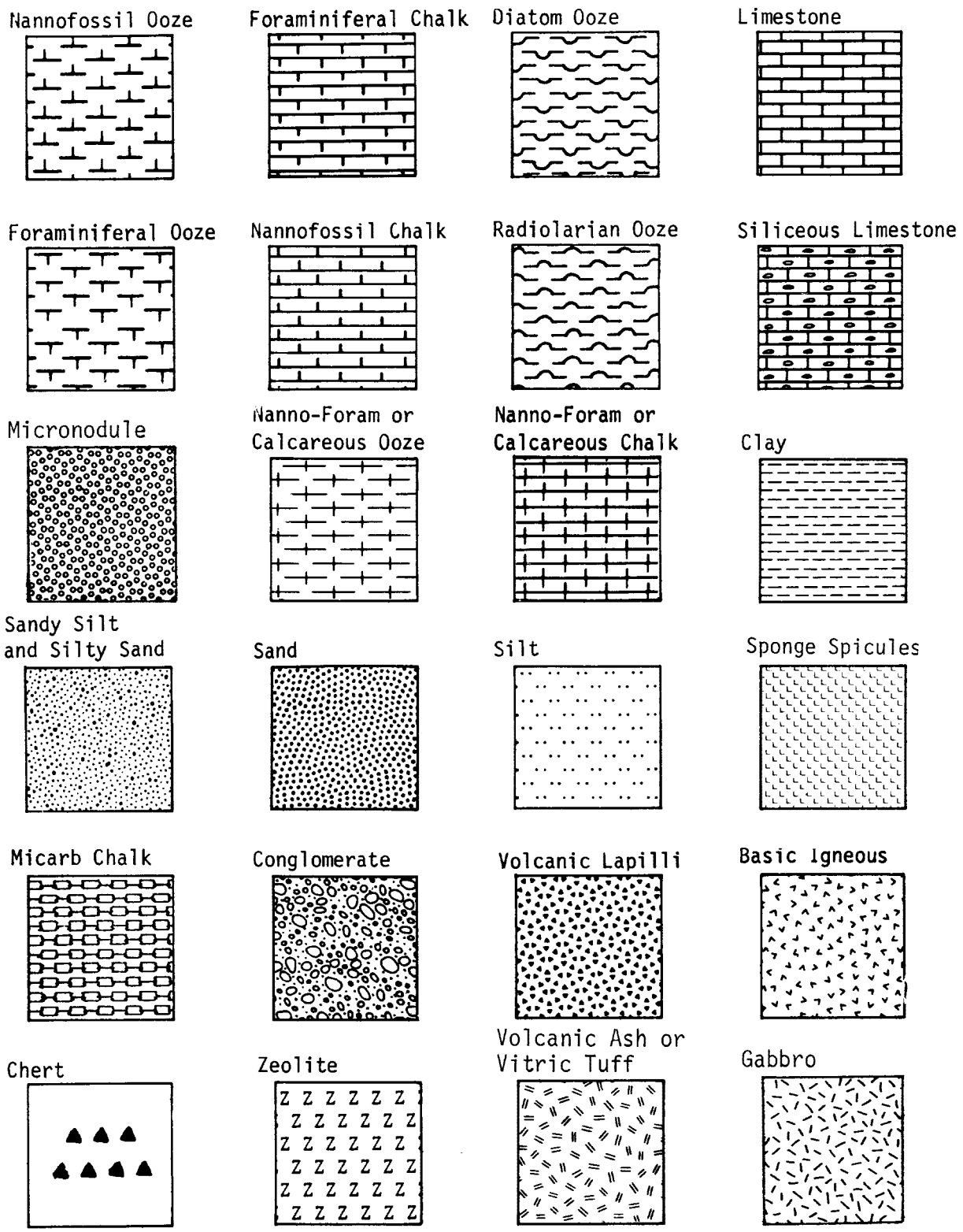


FIGURE 3 LITHOLOGIC SYMBOLS

smear slides of foram nanno ooze, probably because of the smear slides that were too thin. A demonstration of this error, one recognized on earlier legs, is given by taking a 5 cc sample of ooze with a syringe (the needle tip is cut off), extruding it, screening out the 63 micron fraction, and packing this coarse fraction back into the syringe. The volume of the coarse fraction is read from the graduated scale on the syringe. In many instances smear slide and syringe estimates of foram percentages differed by as much as 70%.

Core Forms

The basic lithologic data are contained on core summary forms. As far as possible the data are presented in the following order:

Sediment name

Color name and Munsell or GSA number

The reader is advised that colors recorded in core barrel summaries were determined during shipboard examination immediately after splitting core sections. Experience with carbonate sediments shows that many of the colors will fade or disappear with time after opening and storage. Colors particularly susceptible to rapid fading are purple, light and medium tints of blue, light bluish gray, dark greenish black, light tints of green, and pale tints of orange. These colors change to white or yellowish white or pale tan.

Composition

Structure(s)

X-ray, grain size, and carbon carbonate data

Many cores contain minor important lithologies as well as a basic lithology. The description of the basic lithology is so indicated in most cases, however, descriptive information for minor lithologies is included wherever possible. X-ray data are those generated by the DSDP X-ray mineralogy laboratory at the University of California, Riverside. Grain size and carbon carbonate results are from the DSDP laboratory at Scripps unless otherwise noted.

A sample core form precedes the site-by-site presentation of the cores (Figure 4). On this sample core form is contained all legend and explanatory notes for an understanding of the core forms.

Drilling Deformation

Four degrees of drilling deformation were recognized as follows: A scale of 0 to 5 was used: 0 - indicates undeformed core; 1 - slightly deformed cores exhibit a slight bending of bedding contacts; 2 - moderate bending defines moderate deformation; 3 - in the next stage of deformation the bedding exhibits strong deformation; 4 - in highly deformed cores, injected bedding planes may approach the vertical; and 5 - in extreme deformation all bedding has been destroyed. Occasionally, bedding may be completely disrupted to produce a "drilling breccia."

Downhole Contamination

Downhole contamination is a serious problem. Hard objects (manganese nodules, chert, lithic fragments, and pebbles) are often washed or dragged hundreds of meters downhole. They commonly are lodged in the top of cores or will become incorporated into the middle of cores at levels far below their proper stratigraphic position.

Displaced manganese nodules can usually be recognized. However, displaced chert, lithic fragments, and pebbles are more difficult to recognize. This information is recorded on the core forms.

sample-distribution policy

Distribution of Deep Sea Drilling samples will be undertaken in order to (1) provide supplementary data for inclusion in the appropriate Initial Report to support *Glomar Challenger* scientists in achieving the scientific objectives of their particular cruise, and (2) provide individual investigators with material to conduct detailed studies beyond the scope of the Initial Reports.

The National Science Foundation has established a Sample Distribution Panel to advise on distribution of core material. This panel is chosen in accordance with usual Foundation practices, in a manner that will assure advice in the various disciplines leading to a complete and adequate study of the core and related materials. Funding for the proposed research is handled separately by the investigator, not through the Deep Sea Drilling Project.

Distribution of samples for contributions to Initial Reports

Any investigator who wishes to contribute a paper to a given volume of the Initial Reports may write to the Curator, Deep Sea Drilling Project, Scripps Institution of Oceanography, University of California at San Diego, La Jolla, 92037, requesting samples from a forthcoming cruise. The request should include the nature of the study, and type, size, number of samples, particular sampling techniques or equipment that might be required, and an estimate of the time required to complete the study. The requests will be reviewed by shipboard scientists, and, if they are deemed suitable and pertinent to the objectives of the leg, and shipboard workload permits, the requested samples will be taken during the cruise (provided, of course, material suitable to the investigation is obtained during the drilling). In the case of multiple requests to perform the same investigation, selection of investigator will be made by the shipboard scientific party.

Proposals should be of a scope appropriate to complete the sampling and study in time for publication in the Initial Reports. Studies deemed acceptable will be referred to the Curator who will, with the consent of the NSF Sample Distribution Panel, authorize distribution of the samples. The Sample Distribution Panel and the Deep Sea Drilling Project will strive to ensure a reasonable degree of continuity in the investigations among the various cruises, that the studies are pertinent to goals of the cruise, and that they are consistent with the publication policy for the Initial Reports. Subject to these same provisions, the shipboard scientific party may elect to have special studies of selected core samples of its recently completed cruise made by other investigators.

Investigations not completed in time for inclusion in the Initial Report may not be published in other journals until publication of the Initial Report for

which it was intended.

Distribution of samples for publication other than in Initial Reports

1. Researchers intending to request samples for studies beyond the scope of the Initial Reports should first obtain a sample request form from the Curator. Requests should specify the quantities and intervals of the core required, a statement of the proposed research, the possibility of returning residue to the Curator, the estimated time required to complete and publish the results, and the availability or need of funding and availability of equipment and space foreseen for the research.

In order to ensure that requests for highly desirable but limited samples can all be considered, approval of requests and distribution of samples will not be made prior to 12 months after date of completion of the cruise that collected the cores. Prior to publication of an Initial Report, requests for samples from a cruise can be based on the preliminary shipboard core logs. Copies of these logs will be kept on open file at Scripps and other designated institutions. The only exceptions will be for specific instances involving ephemeral properties.

Requests for samples from researchers in industrial laboratories will be handled in the same manner as those from academic organizations, and there will be the same obligation to publish results promptly. Requests from foreign scientists or organizations will also be considered.

2. The Curator has the responsibility for distributing samples, controlling quality of samples, and preserving core material. He also has the responsibility for maintaining a record of requests for samples that have been processed and filled indicating the investigator and subjects to be studied. This record will be available to investigators.

The distribution of samples will be made directly from the two repositories at Lamont-Doherty Geological Observatory and Scripps by the Curator or his designated representative.

3. (a) Samples up to 10 cc/m of core length can be automatically distributed by the Curator, Deep Sea Drilling Project or his authorized representative to any qualified investigator who requests them. The Curator will refrain from making automatic distribution of any parts of the cores which appear to be in particularly high demand, and any requests for these parts of the cores will be referred to the Sample Distribution Panel for review. Requests for samples from thin layers or important stratigraphic boundaries will generally require Panel review.

(b) All requests for samples in excess of 3(a) above will be referred to the Sample Distribution Panel.

(c) If, in the opinion of scientific investigators, certain properties they wish to study may deteriorate prior to the normal availability of the samples, such investigators may request that the normal waiting period not apply. All such requests

must be approved by the Sample Distribution Panel.

4. Samples will not be provided prior to assurance that funding for sample studies either exists or is not needed. However, neither formal approval of sample requests nor distribution of samples will be made until the appropriate time (Item 1). If a sample request is dependent, either wholly or in part, on proposed funding, the Curator will provide to the organization to whom the funding proposal has been submitted any information on the availability (or potential availability) of samples that it may request.

5. Investigators receiving samples are responsible for:

i) promptly publishing significant results.
ii) acknowledging, in publications, that samples were supplied through the assistance of the National Science Foundation.

iii) submitting 4 copies of all reprints of published results to the Curator.

iv) notifying the Curator of any work done on the samples that is additional to that stated in the original request for samples.

v) returning, in good condition, the remainders of samples after termination of research, if requested by the Curator.

6. Cores will be made available at repositories for investigators to examine and specify exact samples in such instances as this may be necessary for the scientific purposes of the sampling, subject to the limitations of 3 (a), (b), (c), and 5, above, and with the specific permission of the Curator or his delegate.

7. Cores of igneous and metamorphic rocks will also remain at the repositories where they will be available for observation and description and where selected samples may be taken for thin-section preparation and other work.

8. The Deep Sea Drilling Project routinely processes by computer most of the quantitative data presented in the Initial Reports. Space limits in the Initial Reports preclude detailed presentation of all such data. However, copies of the computer readout are available for those who wish the data for further analysis or as an aid in selecting samples.

Magnetics, seismic-reflection and bathymetric data collected under way by the *Glomar Challenger* will also be available for distribution 12 months after completion of the cruise.

Requests for these data may be made to the Chief Scientific Editor of the Deep Sea Drilling Project, at Scripps.

A charge will be made to recover the expenses of responding to individual requests. Estimated charges can be furnished before the request is processed, if required.

9. This policy has the approval of the National Science Foundation and is designed to help ensure that the greatest possible scientific benefit is gained from the materials obtained, and that samples will be made widely available to interested geologists.

(Slightly condensed from the official sample distribution policy of the Deep Sea Drilling Project.)

REFERENCES

Krumbein, W. C. and Pettijohn, F. J., 1938. Manual of Sedimentary Petrography, New York (Appleton-Century).

Shepard, F. P., 1954. Nomenclature based on sand-silt-clay ratios: J. Sed. Petro., v. 24, (3), p. 151-158.

Site Hole Core Cored Interval: Meters below sea floor

AGE	FORAMS NANNOS RADS	FOSSIL CHARACTER			SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
		FOSSIL	ABUND.	PRES.						
	FORAMINIFERA ZONES				0					<p>Color number and/or name.</p> <p>↓</p> <p>All information follows in sequence from Sections 1 through 6 and core catcher.</p> <p><u>Smear Slide Descriptions:</u> Example: SS 1-36 1 = Section and 36 = Interval in cm.</p> <p><u>LEGEND:</u></p> <ul style="list-style-type: none"> G = Glauconite Cl = Clay Nod = Micronodules Z = Zeolite Q = Quartz Fsp = Feldspar HM = Heavy minerals N = Nannofossils G1 = Glass F = Foraminifera S = Sponge spicules SI = Silicoflagellates R = Radiolaria D = Diatoms Opaq = Opaque Py = Pyrite Calc S. = Calcareous spicules Fish D. = Fish debris M = Micarb Calc R. = Calcareous rhombs Fe-O = Fe-oxide Ca = Calcite Chlo. = Chlorite Carb = Carbonate A. Carb = Authigenic carbonate Opaq M. = Opaque minerals Mag = Magnetite Carb U. = Carbonate unspecified A. G1 = Altered glass Plag = Plagioclase Pyrox = Pyroxene Shell = Shell Fer O. = Ferric oxide Iron O. = Iron oxide horn. = hornblende S. sphere = Silicified sphere A. Carb R. = Authigenic carbonate rhombs Vol. R = Volcanic rock Vol. R F = Volcanic rock fragments Sec SiO₂ = Secondary SiO₂ Silica = Silica Vol. G1 = Volcanic glass Bio. Sed. = Biogenic sediment Cl M. = Clay minerals Mi = Mica G1 S. = Glass shards Plant D. = Plant debris <p><u>X-ray, Carbon Carbonate, Grain Size Analyses:</u> X-ray 1-20 (Bulk) Composition (Abbreviations are used for components) Abundance (%) CaCO₃ 1-19 (%) Grain Size 1-2 (% Sand, % Silt, % Clay) Water Content 1-94 (%)</p>
	NANNOFOSSIL ZONES				0.5					
	RADIOLARIAN ZONES				1					
					2					
					3					
					4					
					5					
					6					
					Core Catcher					

Explanatory notes in Chapter 1

Figure 4. Sample Core Form and Legends.

DEEP SEA DRILLING PROJECT

LEG 30 SITE 285

SITE SUMMARY SHEET

POSITION: Latitude: 26°49.16'S Longitude: 162°38.10'E

Water depth (from sea level): 4658 corrected meters (Echo sounding)

Bottom felt at: 4674 meters (drill pipe) Penetration: 285-83.5 m
285A-584 m

Number of Holes: 2 Number of Cores: 285-5, 285A-9

Total length of cored section: 285-45.5 m; 285A-85.5 m

Total core recovered: 285-42.2 m; 285A-47.5 m

Percentage of core recovery: 285-92.7%; 285A-55.5%

OLDEST SEDIMENT CORED:

Depth below sea floor: 564.8 meters Nature: Altered glass shard siltstone

Age: early Middle Miocene

BASEMENT:

Depth below sea floor: 0.65 seconds (reflection time)

Depth below sea floor: 564.8 meters (drilled)

Average velocity to basement: 1.74 km/sec Nature: Diabase sill

PRINCIPAL RESULTS:

Intrusive diabase, age unknown (584-564.8 m); lower middle Miocene clastic rhythms of sandy siltstone and siltstone - main components glass shards and nannofossils (564.8-453 m); lower to upper middle Miocene glass shard-bearing nanno ooze to nanno-bearing glass shard sandy silt (stone) or ash (tuff) - in part reworked (clastic) (453-74 m); upper Miocene nanno radiolarian ooze to nanno ooze (74-24 m); upper Miocene to lower Pliocene nanno ooze (24-18 m); clay-rich zeolite micro-nodulite and zeolite and micronodule-rich clay ("abyssal red clay") unfossiliferous (18 m to sea floor).

Site 285 is situated in a small, east-southeast trending sediment filled basin in the central part of the South Fiji Basin. The sequence at Site 285 parallels that drilled to the northeast at Site 205 (Leg 21) in that a coarse ashy succession is followed by a biogenic section and

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LEG 30 SITE 285
SITE SUMMARY SHEET, con't.

by abyssal clay. However, the volcanoclastic sequences at 205 are not rhythmic. East-west structural ridges in the basin block clastic sedimentation from the south and it is suggested that the source of the volcanic sediment was the Lau Ridge. This provenance conforms to the present slope of the sea floor.

The Oligocene biogenic sequence intersected at Site 205 unconformably below the early middle Miocene ash was not intersected at Site 285. Drilling ended in a diabase sill.

Site 285 Hole Core 1 Cored Interval: 0.0-7.5 m

AGE	FORAMS	NANNOS	RADS	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
				ABUND.	PRES.						
						0					
						1	0.5	Empty			X-ray 1-123 20% Ambr 35% Plag 17% Mont 2% Cl in 20% Cryst 2% Chlo 15% Quar 8% Phil Grain Size 1-126 (3.1, 41.5, 55.4)
						2	1.0	Empty			CLAY RICH ZEOLITE MICRONODULITE, dusky red; soft (slightly crumbly); no internal structures. SS 2-50 40% Nod 24% Cl 2% G1 30% Z Tr% HM
						3		Empty			Grain Size 3-80 (0.0, 37.8, 62.2) QUARTZ AND FELDSPAR BEARING ZEOLITE AND MICRONODULE RICH CLAY, dusky red with irregular patches of dark yellowish orange (10R 6/6) at 75, 100 to 107, and 133 to 137 cm; soft to stiff; no internal structures. SS 3-102 48% Cl 20% Z 5% Fsp 2% HM 20% Nod 5% Q
						4		Empty			Similar; soupy to soft; faint patches of 10YR 6/6.
						5		Empty			CLAY RICH ZEOLITE MICRONODULITE, dusky red with patches of 10YR 6/6 at 50 cm; soupy to soft; no structures. SS 6-140 48% Nod 20% Cl 1% Fsp 30% Z 2% Q 1% HM
						6		Empty			GLASS SHARD BEARING CLAY RICH ZEOLITE MICRONODULITE, dusky red; soft. SS CC 50% Z 5% G1 2% Fsp 40% Nod 2% Q 1% HM Tr% F

Site 285 Hole Core 2 Cored Interval: 17.0-26.5 m

AGE	FORAMS	NANNOS	RADS	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
				ABUND.	PRES.						
						0					
						1	0.5	Empty			X-ray 1-51 62% Ambr 15% Plag 38% Cryst 6% Mica 1% Amph 10% Quar 18% Mont 6% Augi ZEOLITE RICH MICRONODULE CLAY, dusky red; soft; gradual change in color to moderate yellowish brown) from 85 to 105 cm. SS 1-75 35% Cl 20% Z 30% Nod 2% Q 2% HM 1% Fsp Tr% G1
						2	1.0	Empty			CaCO ₃ 1-138 (75) MICRONODULE BEARING NANNO OOZE, moderate yellow brown (10YR 5/4), mixed irregularly with other colors (dusky red, 2YR 3/2, and grayish orange, 10YR 7/4). Some disturbed lamination. SS 2-60 95% N 3% Nod 1% Z Tr% F
						3		Empty			X-ray 3-52 59% Ambr 41% Cryst 3% Calc 9% Quar 5% Mica 6% Mont 63% Phil CaCO ₃ 3-86 (62) CaCO ₃ 4-61 (75) MICRONODULE BEARING NANNO OOZE, yellowish brown to light yellowish brown; soft to stiff. Irregular color patches. SS 4-87 95% N 3% Nod 2% Z Tr% F
						4		Empty			QUARTZ AND FORAM BEARING NANNO RICH MICRONODULE GLASS SHARD ASH, very dark gray, thin disturbed (patchy) lamina. SS 4-95 40% G1 20% N 30% Nod 5% Q 5% F
						5		Empty			X-ray 5-12 50% Ambr 10% Quar 21% Cryst 27% Plag 5% Mont 40% Calc 5% Mica 11% Augi FELDSPAR AND GLASS SHARD BEARING MICRONODULE RICH NANNO RICH CLAY, dusky red; soft. No structures. SS 5-30 40% Cl 25% N 20% Nod 10% G1 5% Fsp
						Core Catcher					CaCO ₃ 5-131 (64) ZEOLITE, MICRONODULE, AND RAD BEARING CLAY RICH NANNO OOZE, moderate yellowish brown (10YR 5/4). SS CC 60% N 8% R 1% D 15% Cl 5% Z 8% Nod 2% S Tr% F

FB - Agglutinated benthonic forams
- Denotes absence

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Site 285 Hole Core 4 Cored Interval: 55.0-64.5 m

AGE	FORAMS	NANNOS	RADS	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
				ABUND.	PREV.						
LATE MIOCENE						0					
				N C 9		1	0.5	Void			CLAY AND GLASS SHARD BEARING NANNO OOZE, light brownish gray; soupy to soft; no internal structures.
				N C 9		2	1.0		*		SS 1-105 85% N 5% C1 1% S 8% G1 1% Z
				N C 9		3					X-ray 1-106 74% Amor 86% Calc 56% Cryst 1% Quar 3% Mont 5% Augi
				N C 9		4					CaCO ₃ 1-107 (54) SS 2-120 85% N 2% Nod 1% F 1% S 9% G1 1% M 1% R
				F R C 9		5					GLASS SHARD RICH NANNO OOZE, light brownish gray or gray (below Section 3-75), with patches and swirls of olive gray; soft.
				F R C 9		6			*		SS 3-69 85% N 3% Nod Tr% Z Tr% S 12% G1 1% F Tr% D
				N C 9		7					Grain Size 3-110 (0.0, 50.6, 49.4)
				N C 9		8					X-ray 3-116 51% Amor 85% Calc 8% Plag 5% Augi 49% Cryst 1% Quar 1% Mont
				F		9					Grain Size 4-61 (0.0, 52.0, 48.0)
				N A 9		10					X-ray 5-136 73% Amor 52% Calc 24% Plag 5% Mont 27% Cryst 4% Quar 2% Mica 13% Augi
				N C 9		11					MICRONODULE, SILICOFAGELLATE, GLASS SHARD AND DIATOM BEARING RAD NANNO OOZE, gray, with streak of light gray, black, and dark olive gray; soft.
				N C 9		12					SS 5-140 37% N 8% G1 2% Fsp 30% R 5% Nod 2% S 10% D 5% S1 1% M1
				N C 9		13					CaCO ₃ 6-40 (16)
				R C P N C F		14					GLASS SHARD, DIATOM, SPONGE SPICULE, SILICOFAGELLATE, MICRONODULE-BEARING, NANNO RAD OOZE, dark greenish gray.
				R C P N C F		15					SS CC 40% R 10% Nod 5% D 4% S1 30% N 5% G1 5% S 1% Plant D.

Site 285 Hole Core 3 Cored Interval: 35.5-45.5 m

AGE	FORAMS	NANNOS	RADS	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
				ABUND.	PREV.						
LATE MIOCENE						0					
				N A 9		1	0.5				RAD BEARING GLASS SHARD NANNO OOZE.
				N C F		2	1.0				SS from top 60% N 1% F Tr% S1 30% G1 1% Nod 1% D 5% R 1% M Tr% S
				N C F		3					GLASS SHARD AND RAD RICH NANNO OOZE, pale brown with swirls of grayish brown (10YR 5/2); soft to stiff.
				N C F		4					SS 1-92 52% N 2% S1 1% Nod 25% R 2% Z 1% F 15% G1 1% Q Tr% D
				N C 9		5					FORAM BEARING MICRONODULE-RICH, NANNO GLASS-SHARD ASH.
				R C 9		6					SS 2-60 20% G1 20% Nod 2% M Tr% S1 35% N 3% F Tr% S
				R C 9		7					CaCO ₃ 2-90 (64)
				R C 9		8					X-ray 2-91 92% Calc 4% Augi 65% Cryst 3% Plag
				R C 9		9					X-ray 3-93 86% Calc 8% Plag 5% Amor 1% Quar 5% Augi 51% Cryst
				N C F		10					2.5Y 6/2 (light brownish gray)
				N A 9		11					10YR 7/2
				N C 9		12					2.5Y 6/2 (light brownish gray); soft to stiff.
				N C 9		13					SS 4-19 77% N 5% G1 1% Fsp 10% R 5% D 3% Nod
				N C 9		14					CaCO ₃ 5-60 (64)
				N C 9		15					MICARB BEARING, GLASS SHARD AND RAD RICH NANNO OOZE; soft to stiff.
				N C 9		16					SS 6-80 55% N 12% G1 1% Z Tr% S 16% R 5% M 1% F Tr% S1
				R C 9		17					MICRONODULE BEARING NANNO OOZE, very pale brown (10YR 7/3).
				R C 9		18					SS CC 85% N 24% G1 2% D 5% Nod 2% S

Site 285 Hole A Core 1 Cored Interval: 131.0-140.5 m

AGE	FORMS	FORAMS	RAIDS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHOLOGIC DESCRIPTION
MIDDLE MIOCENE					0				QUARTZ-FELDSPAR AND NANNO BEARING COARSE GLASS SHARD ASH, very dark gray, soft to stiff; at top rounded pumice fragments (-1.5 cm).
					1	0.5	Empty	*	SS 1-40 87% Gt 10% N Grain Size 1-67 (0.1, 44.3, 55.7)
					2	1.0		*	X-ray 1-67 68% Amor 32% Cryst 44% Calc Below Section 1-128 cm: ZEOLITE BEARING, NANNO RICH GLASS SHARD ASH, dark olive gray, fine grained sediment (clayey silt); stiff.
					3			1/2	SS 1-138 72% Gt 20% N X-ray 2-55 74% Amor 26% Cryst 36% Calc Grain Size 2-60 (0.3, 66.7, 33.0) CaCO ₃ 2-64 (11)
					4			1/2	
					5		Empty		
					6			*	NANNO GLASS SHARD ASH, very dark gray; stiff to semilithified.
					7				SS 6-109 77% Gt 30% N Tr% Fsp
					8			*	NANNO RICH GLASS SHARD ASH, very dark gray (5Y 3/1).
					9				SS CC 76% Gt 20% N 1% Q 1% M 1% F Tr% S

Site 285 Hole A Core 1 Cored Interval: 131.0-140.5 m

AGE	FORMS	FORAMS	RAIDS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHOLOGIC DESCRIPTION
MIDDLE MIOCENE					0				GLASS SHARD RICH NANNO OOZE.
					1	0.5		*	SS From top 72% N 20% Gt 1% Q 1% Fsp 1% M 1% S 1% R
					2	1.0		*	NANNO GLASS SHARD ASH, olive gray; stiff; no structures.
					3			1/2	SS 1-81 58% Gt 44% N Grain Size 1-81 (0.0, 55.2, 44.8)
					4			1/2	GLASS SHARD NANNO OOZE, olive gray, with some darker patches; stiff.
					5			*	SS 2-76 53% N 45% Gt Tr% Q Tr% F
					6			1/2	X-ray 2-77 65% Amor 35% Cryst 8% Gt 8% M 83% N From Section 3-115 to 127 - rounded pumice fragments (-3 cm) in matrix of similar sediment as above. Sediment below Section 3-127 is:
					7			*	MICRONODULE AND GLASS SHARD BEARING NANNO OOZE, olive gray, with vague mottling; stiff; scattered pumice fragments.
					8			1/2	SS 4-76 72% N 8% Gt 3% Nod 2% Fsp 2% M
					9			*	SS 4-110 (lighter patch) 69% N 30% Gt Tr% Z Tr% S
					10			*	X-ray 4-76 66% Amor 34% Cryst CaCO ₃ 4-80 (14)
					11			1/2	From Section 5-108 to 114 - finely laminated laminae slightly inclined. At Section 5-114 - pumice fragments.
					12			*	PYRITE AND NANNO BEARING QUARTZ-RICH GLASS SHARD SAND (Laminae).
					13			1/2	SS 5-112 70% Gt 20% Q 5% Py 5% N
					14			*	Grain Size 6-96 (2.2, 54.4, 43.4)
					15			1/2	RAD AND GLASS SHARD RICH NANNO OOZE, olive gray; stiff.
					16			*	SS 6-97 50% R 50% Gt 12% R 1% S 1% Chlo.
					17			*	GLASS SHARD RICH NANNO OOZE
					18			*	SS CC 73% N 20% Gt 2% Py 2% Nod 1% S

Site 285 Hole B Core 5 Cored Interval: 73.0-83.5 m

Site 285 Hole A Core 5 Cored Interval: 453.0-462.5 m

AGE	FORMAS	NANNOS	RAOS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
EARLY MIDDLE MIOCENE					0					
					1	0.5				
					2	1.0				
					3					
					4					
					5					
					Core Catcher					

Site 285 Hole A Core 6 Cored Interval: 509.5-519.5 m

AGE	FORMAS	NANNOS	RAOS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
EARLY MIDDLE MIOCENE					0					
					1	0.5				
					2	1.0				
					3					
					4					
					5					
					6					
					Core Catcher					

Site 285 Hole A Core 6 Cored Interval: 509.5-519.5 m

Core 5 will contact with basalt in Core 7. Section 6 is a sequence of reworked NANNO RICH ASHES. It displays a rhythmic repetition of 3 intervals characterized by sediment structures and/or structures. The base of each 'rhythm' is erosional. For convenience of description, the intervals are designated here with the letters "a", "b", and "c".

Interval a: Generally micro-cross-laminated, rarely parallel-laminae, at the base, parallel-laminae at the top. Where it gradually merges into interval b. Grain size of this interval ranges from sandy silt to silt. For clearness of description, the "sandy silt" symbol will be used for all intervals a (16).

Interval b: Characterized by vague parallel lamination. Grain size is mainly silt. Gradual contacts with intervals a and c.

Interval c: Characterized by moderate to intense bioturbation (mottling). Grain size is mainly silt. Upper contact with interval a is erosional. Colors of all intervals are mainly dark greenish gray (56Y 4/1) to dark bluish gray (5B 4/1), with lighter and darker shades.

Intervals b and c will be symbolized by "silt" data. Erosional base will be represented by a solid line, other boundaries with a dashed line. Interval symbols "a", "b", and "c" are indicated in "deformation" column, if not clear, a "p" is used.

Please note that micro-cross laminae sets are of thicknesses ranging from a few mm to about 1 cm. Parallel laminae are of the order of 1 mm.

X-ray 2-81
CaCO₃ 2-81 (6)

SS 3-41 3% N 1% M
80% G1 3% Fsp 1% Hi
3% Fsp

Grain Size 3-41 (5, 80, 5)

SS 3-75 2% Fsp 1% M
80% G1 2% Py 1% M
15% N

Grain Size 3-75 (20, 70, 10)

X-ray 3-75 31% Calc 20% Plag 25% Clin
47% Amor 6% Quar 18% Mont
53% Cryst 3% Fsp Tr+K M
SS 4-70 3% Fsp Tr+K M
53% G1 2% Py
12% N

Grain Size 4-70 (5, 85, 10)

MICARB AND FELDSPAR BEARING NANNO RICH GLASS SHARD SILTSTONE.

SS CC
75% G1 12% N 2% Py
15% Fsp 5% M

1. Cores 5 to 7 are semiidentified, lithologic terms used will be "sandy siltstone" (a) and "siltstone" (b and c).

Site 285 Hole A Core 8 Cored Interval: 565.0-574.5 m





AGE	FORMS	NANNOS	RADS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	SY	LITHOLOGIC DESCRIPTION
					0					5Y 4/1	Basalt, olive gray, fine-grained, average grain size <1/2 mm; amygdules and <1 mm diameter; chlorite veins abundant.
					1	0.5				N2	Basalt, grayish black (wet), fine-grained, average grain size <1/2 mm; amygdules of chlorite and/or chlorite (<1 mm diameter); amygdules, average approximately 5% by volume.
					2					N2	Basalt, grayish black, (wet) amygdaloidal, average grain size approximately 3/4 mm, amygdules common with the matrix, between 8 and 100 microns. Section 1 where they constitute 15 to 20% with diameters up to 8 mm; calcite-chlorite veins sparse. Thin section 8-1-2-2: plagioclase laths with interstitial calcium-rich clinopyroxene, magnetite, ilmenite, chlorite and devitrified glass; amygdules filled with antigorite(?), calcite and chlorite; rare phenocrysts plagioclase and clinopyroxene <2 mm.
					3					N2	Diabase, grayish black, (wet) average grain size 1-2 mm, amygdules <2% from 26 to 150 cm Section 2 and below that very sparse antigorite(?), chlorite, calcite veins

Site 285 Hole A Core 7 Cored Interval: 555.0-565.0 m

AGE	FORMS	NANNOS	RADS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	SY	LITHOLOGIC DESCRIPTION
					0					5B 5/1	FELOSPAR BEARING NANO RICH GLASS SHARD TUFF, medium bluish gray. SS From top 20% N 3% Fsp 1% Ni 76% Gt At Section 1-35 and 90 cm, the base of a rhythm has only lensoid remnants of interval 'a', generally of black color. FELOSPAR BEARING ALTERED GLASS SHARD (CHLORITIC) SILTSTONE. SS 1-35 (black remnant) 3% Fsp Grain Size 1-35 (15, 85, 0) SS 1-45 (b) Tr% Fsp Tr% M 92% Gt Tr% Py 8% N Grain Size 1-45 (2, 88, 10) SS 2-83 (a) 30% N 2% Q 2% M 66% Gt Large ZOOPLYCOS burrow, part of central axis exposed (length ~10 cm). Grain Size 2-83 (10, 85, 5) X-ray 6-61 11% Calc 26% Plag 8% Clin 45% Amor 4% Quar Y-ray 6-120 2% Calc 31% Plag 7% Clin 59% Cryst 1% Quar 2% Magn X-ray 6-130 5% Nica 3% Mont 72% Amor 20% Quar 3% Chio 30% Hema 52% Cryst 20% Plag
					1	0.5					
					2						
					3						
					4						
					5						* 'a' interval consist of pebbles of pumice and volcanic rock, size of pebbles ~1 cm * patch of 'faecal pellets' (light gray), base of 'a' is light greenish gray (5G 8/1) At Section 6-112 to 117 and 125 to 130 the rock is reddish tint (112 to 117: very dark 5YR 3/1; 125 to 130: dark reddish brown - 5YR 2.5/6). At Section 6-130 is the boundary (no contact in whole core-piece), with fine-grained basalt. The dark reddish brown sediment is highly altered glass + to Fe-oxide. Glass in sediment at Section 6-112 to 117 is devitrified. 56Y 2/1 (wet-greenish black) fine-grained basalt. Numerous zeolite veins. Thin section show plagioclase laths and pyroxene phenocrysts.
					6						
											Core Catcher

EARLY MIDDLE MIOCENE Sphenolithus heteromorphus Zone

Site 285 Hole A Core 9 Cored Interval: 574.5-584.0 m

AGE	FORAMS	NANNOS	FOSFIDS	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
				ABUND.	PRES.					
						0				
						1	0.5 1.0	Empty 	*	N2 Diabase, grayish black like Section 8-3 above; amygdules very rare; rare phenocrysts of plagioclase <4 mm; grain size medium 1-2 mm average. Thin section 9-1-5.3: 52% Plagioclase, 28% Clinopyroxene, 7% Opaque, 3% Chlorite, and 10% Devitrified Glass(?). Plagioclase laths with interstices filled with Pyroxene, opaques, chlorite and devitrified glass(?).
						2				N2 gabbroic 'zones'
						3			*	N2 Average grain size approximately 2 1/2-3 mm; like the diabase but coarser. Thin section 9-3-4.4: very zoned plagioclase (cores approximately An62) and clinopyroxene (cpx) with a fine-grained (quenched) groundmass; with eschmide: 45% plagioclase, 35% Clinopyroxene, and 20% groundmass.
						4				N2 Thin section 9-4-14.4 like 9-1-5.3 above except grain size average appears to be slightly smaller with definite large areas of devitrified glass: 44% Plagioclase, 31% Clinopyroxene, 8% Opaque, and 17% Devitrified Glass.
						Core Catcher			*	N2 Diabase, grayish black, as above; 26 1/2 cm.

Explanatory notes in Chapter 1

DEEP SEA DRILLING PROJECT

LEG 30 SITE 286

SITE SUMMARY SHEET

POSITION: Latitude: 16°31.92'S Longitude: 166°22.18'EWater depth (from sea level): 4465 corrected meters (Echo sounding)Bottom felt at: 4484 meters (drill pipe) Penetration: 706 mNumber of Holes: 1 Number of Cores: 41Total length of cored section: 383 metersTotal core recovered: 170.4 metersPercentage of core recovery: 44.5 meters

OLDEST SEDIMENT CORED:

Depth below sea floor: 649 meters Nature: Altered ash

BASEMENT:

Depth below sea floor: 0.68 seconds (reflection time)Depth below sea floor: 649 meters (drilled)Average velocity to basement: 1.91 km/sec Nature: Basalt intruded by gabbro

PRINCIPAL RESULTS:

Gabbro (706-659 m) intrusive into extrusive basalt (659-649 m). This basement is overlain by middle to upper Eocene vitric siltstones, vitric sandstones, and volcanic conglomerate (649-197 m); upper Eocene to Oligocene nanno ooze and chalk (197-83 m); Oligocene "red clay" and Pliocene-Pleistocene glass shard ash (83 m-sea floor).

Site 286 is located at the foot of the slope from Malekula in a gap between the North and South New Hebrides Trenches.

Basaltic flows extruded in middle Eocene time were followed by rapid sedimentation, probably in the form of a submarine fan at the base of a volcanic ridge with active andesitic volcanism, until near the end of the Eocene. Sea floor depth was above the foram solution depth. Volcanic activity declined sharply during the late Eocene and Oligocene and mainly biogenic sediments with minor ash were deposited on a subsiding sea floor. By latest Oligocene time, the depths were below both foram and nanno solution depths with clay and glass shard ash accumulating. A period of nondeposition or erosion intervenes before the Pliocene, to

LEG 30 SITE 286
SITE SUMMARY SHEET, con't.

be followed in Pliocene and Pleistocene time by a continuous influx of glass shard ash from fairly distant sources. Reworked fossils, including shallow-water benthonic neritic species of Miocene and Pliocene age near the top of the section suggest erosion of nearby older shelf deposits (on the New Hebrides or Loyalty Islands) during the Pleistocene.

Site 286 Hole Core 2 Cored Interval: 16.5-26.0 m

AGE	FORAMS	NANNOS	FOSSIL RADS	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHOLOGIC DESCRIPTION
				ABUND.	PRECS.					
PLEISTOCENE						0				
				N C F		1	0.5	Empty		HEAVY MINERALS, CLAY, GLASS SHARD, MICARB-BEARING NANNO OOZE, yellowish brown; soft.
				N C F		2	1.0			SS 1-120 50% N 10% M 5% HM 2% S 10% C1 2% Py 2% Plant D.
				N C F		3				10YR 5/4 streaked and mottled 10YR 4/4 10YR 4/3 CaCO ₃ 2-68 (2.1) Water Content 2-126 (69)
				N C F		4				FELOSPAR, NANNO, QUARTZ, AND MICRONODULE BEARING CLAY GLASS SHARD ASH, brown; soft.
				N C F		5				SS 2-133 48% G1 30% C1 5% Q 5% Nod 3% Fsp
				N C F		6				gradual color change 7.5YR 4/4 10YR 4/4 10YR 4/4 10YR 5/4 Water Content 3-118 (57)
				N C F		7				GLASS SHARD AND NANNO BEARING FORAM RICH MICARB OOZE, light yellowish brown, mottled; soft.
				N C F		8				SS 4-106 70% M 20% F 5% G1 5% N Water Content 4-110 (60)
				N C F		9				HEAVY MINERALS, FELOSPAR, ZEOLITE, MICARB, AND QUARTZ BEARING CLAY MICRONODULE RICH GLASS SHARD ASH, brown; mottled; soft.
				N C F		10				SS 5-110 30% G1 5% Nod 11% C1 X-ray 6-70 6% Quar 32% Cryst 5% Calc Water Content 6-80 (60)
				N C F		11				mixed 2.5Y 3/2 and 10YR 7/3 7.5YR 4/4 10YR 5/4 7.5YR 4/4 7.5YR 4/4 10YR 5/4
				N C F		12				14% Mont 2% Amph 2% C1in 12% Aug1 10% Ph11

- denotes absence

Site 286 Hole Core 1 Cored Interval: 0.0-7.0 m

AGE	FORAMS	NANNOS	FOSSIL RADS	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHOLOGIC DESCRIPTION
				ABUND.	PRECS.					
PLEISTOCENE						0				
				N C F		1	0.5	Empty		MICARB, DIATOM, AND NANNO-BEARING MICRO-NODULE AND GLASS SHARD ASH-RICH RAD OOZE, dark brown, mottled with very dark gray; soupy to soft.
				N C F		2	1.0			SS 1-96 30% R 20% Nod 18% G1 5% M 2% HM 2% Plant D.
				N C F		3				Grain Size 2-12 (5, 62, 33) X-ray 2-16 67% Amor 3% Quar 36% Plag Fsp 11% Calc 3% Mica 2% Anal Water Content 2-82 (56)
				N C F		4				DIATOM-SPONGE SPICULE-RADIOLARIAN-MICRONODULE-MICARB-BEARING BEARING GLASS SHARD ASH, brown; soupy to soft, slightly mottled.
				N C F		5				SS 2-100 48% G1 10% Nod 10% N 5% S 2% R 2% F
				N C F		6				FORAM AND SPONGE SPICULE BEARING GLASS SHARD RICH NANNO OOZE, grayish brown; soupy, mottled to swirled.
				N C F		7				SS 4-28 70% G1 15% G1 5% F 2% D 2% R 1% Fsp
				N C F		8				Grain Size 4-132 (58)
				N C F		9				FELOSPAR, MICRONODULE, ZEOLITE, SPONGE AND QUARTZ BEARING GLASS SHARD MICARB OOZE, brown; soupy to soft, mottled to swirled.
				N C F		10				SS 5-32 30% M 30% G1 10% N 5% S 2% O 2% Mi

Site 286 Hole Core 3 Cored Interval: 35.5-45.0 m

AGE	FORAMS	NANNOS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHOLOGIC DESCRIPTION
LATE PLEISTOCENE				0		Empty		
			F	1	0.5			X-ray 1-110 63% Amor 31% Plag 1% Cl in 11% Aug1 37% Cryst 8% Mica 25% Ph1 5% Quar 17% Mont 2% Amph
			N	2	1.0			ZEOLITE, MICA, MICARB BEARING MICRONODULE RICH GLASS SHARD ASH, dark yellowish brown, unbedded; soft. SS 1-145 10% Z 3% Mi 1% Fsp 15% Nod 5% M 2% Q
			F R F	3				Water Content 2-28 (60) Grain Size 2-79 (0, 42, 58) Water Content 3-77 (52)
			N	4				Water Content 4-68 (61) PYRITE, CLAY, GLASS SHARD, MICARB, ZEOLITE BEARING NANNO OOZE, yellowish brown; soft. SS 4-95 8% M 5% G (altered) 2% Nod 67% N 5% C 3% Py 10% Z
			N R P	5				mottled 10YR 4/4 and 10YR 5/4 Water Content 5-112 (57) Grain Size CC (5, 51, 44)
			F A e	6				10YR 4/4 10YR 4/4 swifled with 10YR 5/3 PLANT DEBRIS, NANNO, QUARTZ(?), HEAVY MINERALS, MICARB, MICRONODULE, FELDSPAR BEARING, GLASS SHARD (altered) RICH CLAYEY SILT, brown; soft.
			F R P	7				SS CC 10% Nod 5% M 67% C 5% O 3% N 15% G 5% Py 10% Fsp

Site 286 Hole Core 4 Cored Interval: 54.5-64.0 m

AGE	FORAMS	NANNOS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHOLOGIC DESCRIPTION
				0		Empty		
			F C F	1	0.5			MICA AND MICRONODULE BEARING GLASS SHARD BEARING GLASS SHARD ASH, dark brown, mottled and streaked with yellow brown; soft, with thin (2mm) layers of foraminifer sand. SS 1-96 5% Mi 2% Fsp 81% G 10% Nod 2% Q 10% X-ray 1-100 76% Amor 38% Do10 4% Mica 7% Ph1 24% Cryst 12% Quar 2% Chlo 2% Ana1 4% Calc 20% Plag 11% Mont Water Content 1-106 (53) Grain Size 1-107 (5, 35, 60)
			F R F	2	1.0			GLASS SHARD-BEARING MICARB RICH NANNO OOZE, dark brown; soft. SS CC 7% G 1% Mi 73% N 1% Fsp 15% M

Site 286 Hole Core 6 Cored Interval: 92.5-102.0 m

AGE	FORAMS	MANNOS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHOLOGIC DESCRIPTION
LATE OLILOCENE				0				
				1	0.5-1.0	Empty		
				2				
				3				
				4				
				5				
				Core Catcher				

Site 286 Hole Core 5 Cored Interval: 73.5-83.0 m

AGE	FORAMS	MANNOS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHOLOGIC DESCRIPTION
? LATE OLILOCENE				0				
				1	0.5-1.0	Empty		
				2				
				3				
				4				
				5				
				Core Catcher				

Site 286 Hole Core 7 Cored Interval: 111.5-121.0 m

AGE	FORMS	MANOS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
LATE OLIGOCENE	Sphenolithus distentus	Theocyrtis tuberosa Zone	N C f	0	0.5				10YR 4/3 mottled with 10YR 5/4 10YR 5/4 mottled with 10YR 4/4
			R C f	1	1.0				Water Content 1-55 (56) SS 2-150 92% N 5% S 3% Z 1% Q 1% M
			F R P	2					Water Content 2-77 (52) ZEOLITE AND SPONGE SPICULE-BEARING NANNO OOZE, yellowish brown; stiff; slightly mottled.
			N C f	3					Water Content 3-50 (52) X-ray 3-50 41% Amor 83% Calc 59% Cryst 10% Plag 3% Quar 4% Mont
			F B R P	4					Water Content 4-75 (51) GLASS SHARD BEARING MICROMODULE, RAD, AND SPONGE SPICULE RICH NANNO OOZE, yellowish brown, stiff.
			R R f	5					SS 4-140 45% N 20% S 15% Mod 15% R 5% G1
			R R f	6					Water Content 5-60 (46) QUARTZ(?) MICROMODULE BEARING GLASS SHARD-RICH NANNO OOZE, dark yellowish-brown; stiff; small patches of heavy mineral bearing sand at Section 6-38 to 40.
			F B R R f	Core Catcher					SS 6-42 74% N 15% G1 3% (?) Q 1% F Water Content 6-75 (46) Grain Size 6-76 (2, 50, 48) GLASS SHARD, MICROMODULE, AND RAD-BEARING SPONGE SPICULE RICH NANNO OOZE, brown; stiff.
			F B R R f	Core Catcher					SS CC 62% N 16% S 10% R 5% G1 5% Mod 2% IM

FB indicates the occurrence of benthonic foraminifera only.

Site 286 Hole Core 8 Cored Interval: 130.5-140.0 m

AGE	FORMS	MANOS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
EARLY OLIGOCENE	P18		N C f	0					SPONGE SPICULE BEARING NANNO OOZE, pale brown; stiff to semilithified min. dark gray streaks and mottles; volcanic granules present at Section 2-10, and volcanic pebble 1/4" diameter at Section 2-83.
			F T P	1	0.5				SS 1-70 92% N 5% S 2% G1 1% Q Water Content 1-71 (44) CaCO ₃ 1-100 (44)
			R R f	2					NANNO OOZE, SS 2-10. Water Content 2-50 (43)
			F R f	3					Water Content 3-45 (42)
			N C f	Core Catcher					ZEOLITE, FORAM BEARING MICARS NANNO OOZE, pale brown; stiff to very stiff.
			F B R R f	Core Catcher					SS CC 62% N 30% M 5% F 3% Z

Site 286 Hole Core 12 Cored Interval: 206.5-216.0 m

AGE	FORAMS	NANNOS	RADS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHOLOGIC DESCRIPTION
LATE EOCENE					0				Water Content 2-5 (36) X-ray 2-54 31% Amor 1% Quar 5% Mont 69% Cryst 94% Plag Olive gray siltstone, moderately to intensely bioturbated, fine grained sandstone in thin (1-2 cm) beds; minor x and parallel microlaminations. ZEOLITE, QUARTZ, BEARING HEAVY MINERAL, AND FELDSPAR RICH, GLASS SHARD SANDSTONE, greenish gray; semilithified, fine to medium grained. SS 2-145 15% HM 5% Z 20% Fsp 10% Q(?) OPAQUES, VOLCANIC ROCK FRAGMENTS, ALTERED GLASS SHARDS AND QUARTZ(?) BEARING CLAY AND GLASS RICH FELDSPAR SILTSTONE, greenish gray; semilithified. SS 2-147 10% Q(?) 2% HM 1% R 30% Fsp 5% Opaq 1% G 1% S 14% Ct 5% Vol. R F 1% N
					1	0.5	Empty		
					2	1.0		MC	
									5Y 4/1 and minor 56T 6/1
									10YR 5/1
									SS CC 5% Nod 3% M1 60% G1 5% S 3% R 15% N 5% S 3% R 5% HM 3% Q 1% Fsp

Site 286 Hole Core 14 Cored Interval: 244.5-254.0 m

AGE	FORAMS	NANNOS	RADS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHOLOGIC DESCRIPTION
LATE EOCENE					0				MANNO BEARING, GLASS SHARD RICH HEAVES AND FELDSPAR SAND, gray; semilithified, fine-grained. SS 1-94 40% Fsp 23% G1 1% R 30% HM 5% N 1% S Water Content 1-133 (36) Water Content 2-56 (41) ZEOLITE, MICROMODULE, PYROXENE BEARING GLASS SHARD, QUARTZ, MANNO, FELDSPAR RICH SAND, gray; semilithified, coarse-grained. SS 2-89 15% G1 4% Nod 1% F 25% Fsp 10% M 3% Z 20% N 15% Q(?) 5% HM 2% S1 X-ray 2-108 38% Amor 3% O 12% Mont 61% Cryst 7% Plag 7% Calc 1% Chlo
					1	0.5	Empty		
					2	1.0			
									This core, and the succeeding cores through 19, consist of siltstone and sandstone composed dominantly of siltstone. The rocks were originally deposited in rhythmic sedimentary cycles comprising a sandstone basal unit (usually graded) and overlying sequences of siltstone characterized by: 1) parallel microlamination; 2) cross bedded microlamination; 3) bioturbation; or 4) structureless siltstone. The order of these siltstone units is variable and they may space several times between basal units. Some units may be easily lost to drilling disturbance. Only a few short segments, generally no more than 1 to 2 feet long, are continuous, and only a few of these exhibit all the types of sedimentary structures found throughout the cores. For convenience, the following categories are recognized and designated by letter symbol. Note that these symbols differ slightly from those defined for Site 285. Also note that 2 or more types may occur together; e.g. b, g, c. Interval a - graded sandstone, with little or no parallel or cross bedded microlamination. Interval b - well developed microlamination in either siltstone or sandstone; may be parallel or cross bedded, but parallel predominates. Non-parallel microlaminations are indicated by <u>X</u> . Interval c - bioturbated, intensely bioturbated siltstone. Interval d - massive, structureless, or only slightly mottled siltstone or sandstone. SPONGE SPICULE, ZEOLITE, PYLITE, MICA, FELDSPAR, QUARTZ(?) BEARING GLASS SHARD (VITRIC) SILTSTONE, gray; semilithified. SS CC 62% G1 7% Fsp 5% Z 10% Q 5% M1 5% S

Site 286 Hole Core 13 Cored Interval: 225.5-235.0 m

AGE	FORAMS	NANNOS	RADS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHOLOGIC DESCRIPTION
LATE EOCENE					0				Grain Size 2-11 (6, 67, 27) Volcanic siltstone, light to medium gray with light to olive gray, mottled, with parallel microlamination. Core top 2-20 to 35 cm dark gray, fine gray sandstone in graded beds 1 cm thick, and small pockets of medium grained gray sandstone; semilithified. Water Content 2-55 (43) Grain Size 2-98 (64, 31, 5)
					1	0.5	Empty		
					2	1.0			
									QUARTZ, FELDSPAR, SPONGE SPICULE-BEARING MANNO RICH VOLCANIC GLASS (VITRIC) SILTSTONE, gray; semilithified. SS CC 10% S 3% Fsp 2% F 58% G1 3% Q 2% R 20% N 3% Q

Site 286 Hole Core 15 Cored Interval: 263.5-273.0 m

AGE	FORAMS	NANNOS	RADS	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
				ABUND.	PRES.						
LATE EOCENE				F	T	0	0.5	Empty			Grain Size 1-88 (0, 61, 39) Water Content 1-95 (33) CaCO ₃ 1-140 (16)
				R	P	1	1.0				← pumice fragment 1/2" diameter at Section 1-148. 5Y 5/1 FELDSPAR, QUARTZ, SPONGE SPICULE BEARING NANNO RICH GLASS SHARD SILTSTONE, gray, semilitthified.
				N	C						5S CC 28% N 15% Q 8% S 1% R
				F	T			Core Catcher			
				R	P						

Site 286 Hole Core 16 Cored Interval: 282.5-292.0 m

AGE	FORAMS	NANNOS	RADS	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
				ABUND.	PRES.						
LATE EOCENE				F	T	0	0.5	Empty			Water Content 1-86 (34) QUARTZ, MICARB, NANNO, HEAVY MINERAL BEARING FELDSPAR RICH VITRIC SILTSTONE, medium dark gray, semilitthified.
				R	P	1	1.0				5S 1-92 21% Fsp 7% HM 3% N 3% Q 2% Z
				N	C						Water Content 2-95 (40)
				F	T			Core Catcher			SPONGE SPICULE, MICRONODULE, NANNO-BEARING VITRIC SILTSTONE, gray, semilitthified.
				R	P						5S CC 50% G 10% N 3% S 2% Q 2% Fsp

Site 286 Hole Core 17 Cored Interval: 301.5-311.0 m

AGE	FORAMS	NANNOS	RADS	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
				ABUND.	PRES.						
MIDDLE EOCENE				N	C	0	0.5	Empty			Water Content 1-15 (39) X-ray 1-15 5% Fluor 16% Calc 70% Diag 48% Cryst 2% Quar 12% Mont
				R	P	1	1.0				QUARTZ(?), FELDSPAR, MICARB BEARING GLASS SHARD (VITRIC) SILTSTONE, gray, semilitthified.
				N	C						5S 1-110 77% G 5% Q 2% N 5% Fsp 2% HM 2% S 5% M 2% Py 1% R
				F	T			Core Catcher			
				R	P						Convolute microlaminae at Section 3-70.
				N	C	2		Empty			
				R	P	3					OPAQUE MINERAL BEARING FELDSPAR GLASS SHARD (VITRIC) SANDY SILTSTONE, greenish gray; semilitthified; coarse sand grains scattered in siltstone matrix.
				N	C						5S 4-128 59% G 30% Fsp 5% Opaq 2% N 2% S
				F	T			Core Catcher			
				R	P						Water Content 4-141 (43) Grain Size 5-61 (3, 67, 30) CaCO ₃ 5-63 (12)
				N	C	4					HEAVY MINERALS, QUARTZ(?), BEARING NANNO RICH FELDSPAR-GLASS SHARD SANDSTONE, olive gray, semilitthified, very fine grained, with parallel and cross microlaminations.
				F	T			Core Catcher			
				R	P						5S 5-114 30% Fsp 15% N 10% Q(?) 2% Z
				N	C	5					Water Content 5-119 (33)

Site 286 Hole Core 18 Cored Interval: 320.5-330.0 m

AGE	FORMS	MANNOS	RADS	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
				ABUND.	PRES.						
MIDDLE EOCENE	Discoster salpanensis	?	?	R	T	0	0.5	Empty			VOLCANIC RICH SILTSTONE, greenish gray, mottled, moderate to intense; semilithified. Water Content 1-121 (38)
				R	T	1	1.0	Empty	c		56Y 6/1
				R	T	2	2.0	Empty	c		56Y 4/1
				R	T	3	3.0	Empty	d		5Y 4/1 and 56Y 6/1
				R	T	4	4.0	Empty	b		Water Content 2-142 (45)
				R	T	5	5.0	Empty	c		56Y 4/1
				R	T	6	6.0	Empty	MC		
				R	T	7	7.0	Empty			56Y 4/1 mottled with 56Y 6/1
				R	T	8	8.0	Empty			MICRONODULE, SPONGE SPICULE BEARING GLASS SHARD MANNOS CHALK, olive gray; semilithified.
				R	T	9	9.0	Empty			5Y 4/1
				R	T	10	10.0	Empty			5Y 4/1
				R	T	11	11.0	Empty			SS CC 10% S 2% F 55% N 45% G 5% Nod 2% R
				R	T	12	12.0	Empty			

Site 286 Hole Core 20 Cored Interval: 358.5-368.0 m

AGE	FORMS	MANNOS	RADS	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
				ABUND.	PRES.						
MIDDLE EOCENE	Discoster salpanensis	?	?	R	T	0	0.5	Empty			Drilling breccia composed of broken bits of conglomerate with clasts ranging from granules to pebbles 1 cm in diameter; set in a coarse-grained sandstone matrix; minor fragments of greenish gray mottled siltstone also present. Most clasts in conglomerate are pumice and volcanic glass, and are subrounded.
				R	T	1	1.0	Empty			5Y 4/1
				R	T	2	2.0	Empty			4
				R	T	3	3.0	Empty			FELOSPAR, QUARTZ(?), MANNOS-BEARING, HEAVIES AND FELDSPAR RICH VITRIC SANDSTONE, very dark gray; semilithified.
				R	T	4	4.0	Empty			SS CC 5% Q(?) 3% F 5% Sp 10% N 2% M 1% S
				R	T	5	5.0	Empty			5Y 3/1
				R	T	6	6.0	Empty			
				R	T	7	7.0	Empty			
				R	T	8	8.0	Empty			
				R	T	9	9.0	Empty			
				R	T	10	10.0	Empty			

Site 286 Hole Core 19 Cored Interval: 339.5-349.0 m

AGE	FORMS	MANNOS	RADS	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
				ABUND.	PRES.						
MIDDLE EOCENE	Discoster salpanensis	?	?	R	T	0	0.5	Empty			Water Content 1-95 (37)
				R	T	1	1.0	Empty	c		medium coarse-grained sandstone, with minor mottled siltstone
				R	T	2	2.0	Empty	b		5Y 4/1
				R	T	3	3.0	Empty	d		SPONGE SPICULE, MICARB., QUARTZ(?) BEARING MANNOS AND FELDSPAR-RICH VITRIC SANDSTONE, olive gray; semilithified; fine grained.
				R	T	4	4.0	Empty			SS 1-102 38% G 15% N 5% Q(?) 20% Fsp 5% S 5% M 2% Z
				R	T	5	5.0	Empty			MICARB., HEAVIES, FELDSPAR, MANNOS BEARING QUARTZ(?), RICH GLASS SHARD (VITRIC) SANDSTONE, olive gray; semilithified.
				R	T	6	6.0	Empty			SS CC 15% Q(?) 10% N 5% M 7% Fsp 1% S
				R	T	7	7.0	Empty			
				R	T	8	8.0	Empty			
				R	T	9	9.0	Empty			
				R	T	10	10.0	Empty			

Site 286 Hole Core 21 Cored Interval: 377.5-387.0 m

AGE	FORMS	MANNOS	RADS	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
				ABUND.	PRES.						
MIDDLE EOCENE	Discoster salpanensis	?	?	R	T	0	0.5	Empty			CONGLOMERATE, with clasts of pumice and volcanic glass up to 1 1/2 cm in diameter, set in coarse-grained sandstone matrix, a also mainly of volcanic origin; no bedding visible, flat, crude cleavage; penetration is provided by flat fragments that lie mainly in the horizontal plane; lithified.
				R	T	1	1.0	Empty			56Y 4/1 + pumice fragment - 2 cm in diameter
				R	T	2	2.0	Empty			Water Content 1-91 (26)
				R	T	3	3.0	Empty			X-ray 2-92 49% Amor 11% Calc 51% Cryst 81% Plag
				R	T	4	4.0	Empty			FELOSPAR, MANNOS, AND MICARB-BEARING VITRIC SANDSTONE, gray, fine grained, interbedded with coarse-grained sandstone and thin beds of granule conglomerate; pumice fragments up to 1/4" diameter scattered through siltstone.
				R	T	5	5.0	Empty			SS 2-108 77% G 10% N 2% HM 2% S 10% M 3% Fsp 1% R
				R	T	6	6.0	Empty			2.5Y 6/1
				R	T	7	7.0	Empty			2.5Y 4/1
				R	T	8	8.0	Empty			FELDSPAR, QUARTZ(?), HEAVIES, BEARING, MICARB., MANNOS RICH VITRIC SANDY SILTSTONE, gray; semilithified.
				R	T	9	9.0	Empty			SS CC 40% G 17% M 5% Q(?) 25% N 8% HM 3% Fsp 2% S
				R	T	10	10.0	Empty			SS CC? VITRIC SANDSTONE, dark gray.

Site 286 Hole Core 23 Cored Interval: 415.5-425.0 m

AGE	FORAMS	NANNOS	RAOS	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHOLOGIC DESCRIPTION
				ABUND.	PRESENCE					
MIDDLE EOCENE						0				
						1	0.5	Empty		FELDSPAR BEARING NANNO AND MICARB RICH VITRIC SILTSTONE, greenish gray; semilithified. SS 1-133 32% G 20% H 5% Fsp Water Content 1-141 (40)
						2	1.0			56Y 4/1 Water Content 2-95 (39) CaCO ₃ 2-95 (3) Grain Size 2-95 (2, 61, 37) + Andesite pebble, 5 cm diameter (thin section) X-ray 2-106 71% Am 29% Cryst 3% Calc 66% Pl30 1% Chlor 22% Mont + flame structure at base of sandstone bed
						Core Catcher				56Y 4/1 NANNO, MICARB, AND FELDSPAR BEARING VITRIC SILTSTONE, dark greenish gray; lithified. SS CC 80% G 7% Fsp 5% M 2% HM 2% N 1% S

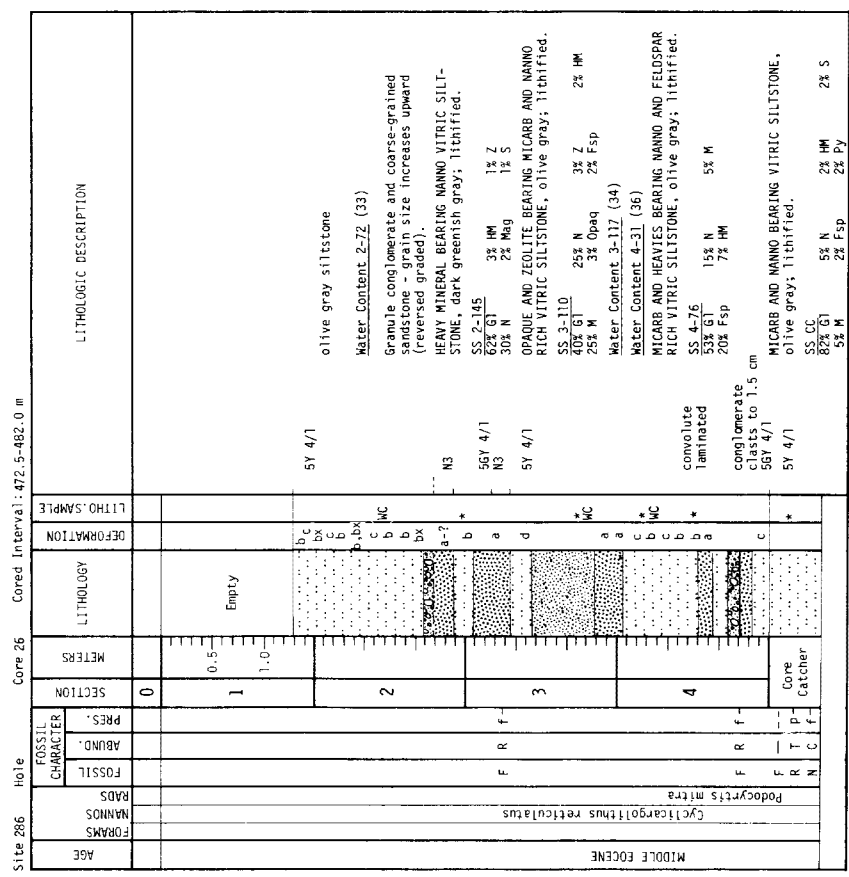
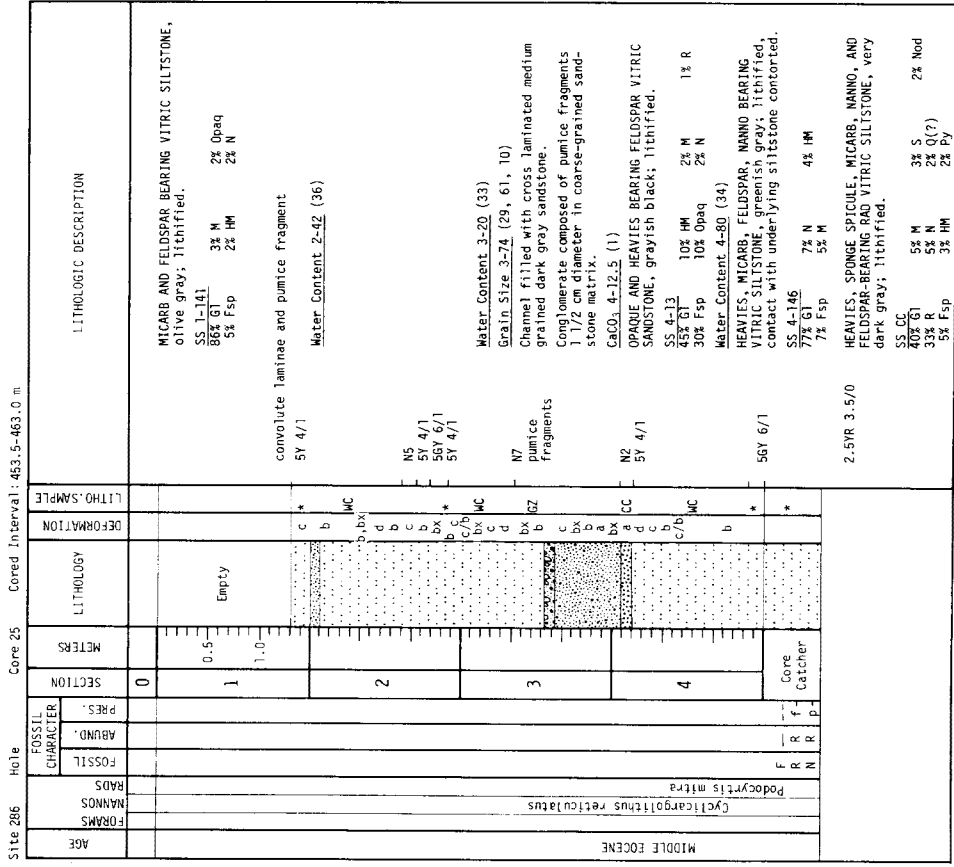
Site 286 Hole Core 24 Cored Interval: 434.5-444.0 m

AGE	FORAMS	NANNOS	RAOS	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHOLOGIC DESCRIPTION
				ABUND.	PRESENCE					
MIDDLE EOCENE						0				
						1	0.5	Empty		
						2	1.0			Siltstone, olive gray, lithified with minor grayish black (N2) fine grained sandstone. Water Content 2-10 (56) + pumice fragments
						Core Catcher				ZEOLITE, AND FELDSPAR BEARING HEAVIES AND MICRONODULE RICH VITRIC SILTSTONE, dark gray; lithified. SS CC 15% Mod 13% HM 5% Fsp 1% Q 3% Z 1% S

Site 286 Hole Core 22 Cored Interval: 396.5-406.0 m

AGE	FORAMS	NANNOS	RAOS	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHOLOGIC DESCRIPTION
				ABUND.	PRESENCE					
MIDDLE EOCENE						0				
						1	0.5	Empty		CONGLOMERATE, with pumice and volcanic glass fragments up to 2 cm in diameter; no grading or bedding visible. Shallow water fossils, including forams, shell fragments, and algal encrustings, are found in very small abundance scattered throughout core. These are designated "sp". Water Content 1-97 (20)
						2	1.0			NANNO AND MICARB BEARING VITRIC SILTSTONE, greenish gray; semilithified, mottled, with scattered sand grains present and a thin layer of granule conglomerate. SS 2-47 pumice fragment 3 cm long
						3				clast of bioturbated dark greenish gray siltstone - 3 cm long Chemical Analysis #2 at Section 3-100
						4				This section CC: Large fragment in Section is 7 mm. Rock is a mixture of pebble size volcanic rock fragments (pumice, andesite and basalt), subangular to angular, in a matrix of sand to granule size rock fragments and crystals (fragments) and silt and clay size particles (nanos, micarb and clay minerals). No quartz detected. Phenocrysts and loose crystals are mainly feldspars and pyroxenes.

Explanatory notes in Chapter 1



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Site 286 Hole Core 29 Cored Interval: 529.5-539.0 m

AGE	FORAMS	MANNOS	RAOS	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
				ABUND.	PREV.						
MIDDLE EOCENE						0					
						1	0.5	Empty			ZEOLITE AND FELDSPAR BEARING VITRIC SILTSTONE, olive gray, lithified.
						2	1.0				SS 1-146 88% Gt 3% Fsp Water Content 2-76 (31) OPAUQUE, MICARB BEARING FELDSPAR VITRIC SILTSTONE, greenish gray; lithified.
						3					SS 2-140 60% Gt 30% Fsp Water Content 3-85 (40) Sandstone, gray, graded from medium at base to fine at top, flame structure at base.
						4					SS 4-74 35% Gt 33% Fsp CaCO ₃ 5-99 (0) Water Content 4-58 (41) RdO, FELDSPAR VITRIC SILTSTONE, dark greenish gray; lithified.
						5					SS 5-130 84% Gt 7% N Very fine grained, silty sandstone with granules of white pumice. MICARB, SPONGE SPICULE, NANNO, BEARING VITRIC SILTSTONE, greenish gray; lithified.
						5					SS 2-64 57% Gt 17% HM Grain Size 2-87 (13, 71, 16) FELDSPAR, MICARB, NANNO BEARING VITRIC SILTSTONE. SS 2-98 Grain Size 2-130 (0, 67, 33) VITRIC SILTSTONE

Explanatory notes in Chapter 1

Site 286 Hole Core 27 Cored Interval: 491.5-501.0 m

AGE	FORAMS	MANNOS	RAOS	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
				ABUND.	PREV.						
MIDDLE EOCENE						0					
						1	0.5	Empty			
						2	1.0				N7 + flame structure at base of sandstone N6 and 56Y 6/1 Water Content 2-78 (36) vertical streaks due to dewatering of sediment HORNBLENDE, ZEOLITE, MICARB, NANNO BEARING VITRIC SILTSTONE, light gray; lithified.
						2					SS 2-147 60% Gt 10% M 10% N 5% Z 2% S FELDSPAR AND NANNO BEARING VITRIC SILTSTONE, gray; lithified. SS CC 81% Gt 10% N 5% HM 1% Q 3% Fsp

Explanatory notes in Chapter 1

Site 286 Hole Core 28 Cored Interval: 510.5-520.0 m

AGE	FORAMS	MANNOS	RAOS	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
				ABUND.	PREV.						
MIDDLE EOCENE						0					
						1	0.5	Empty			NANNO AND MICARB BEARING VITRIC SILTSTONE, light gray; lithified, mottled, and burrowed, with burrows filled with fine sandstone.
						2	1.0				SS 1-106 80% Gt 10% M 5% N 2% R 1% S Water Content 1-117 (35) X-ray 2-22 60% Amor 20% Cryst Water Content 2-30 (37) NANNO AND MICARB-BEARING FELDSPAR AND HEAVY MINERAL RICH VITRIC SANDSTONE, gray; lithified, reverse graded, fine grained.
						2					SS 2-64 57% Gt 17% HM Grain Size 2-87 (13, 71, 16) FELDSPAR, MICARB, NANNO BEARING VITRIC SILTSTONE. SS 2-98 Grain Size 2-130 (0, 67, 33) VITRIC SILTSTONE

Explanatory notes in Chapter 1

Site 286 Hole Core 30 Cored Interval: 548.5-558.0 m

AGE	FORAMS	MANNOS	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
			ABUND.	PRESENCE						
MIDDLE EOCENE					0		Empty			
					1	0.5				Siltstone and minor sandstone, greenish gray, dark greenish gray, and light gray.
					1	1.0				Water Content 1-103 (40) 56Y 6/1, 56Y 4/1
					2					
					Core Catcher					

Site 286 Hole Core 31 Cored Interval: 567.5-577.0 m

AGE	FORAMS	MANNOS	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
			ABUND.	PRESENCE						
MIDDLE EOCENE					0		Empty			
					1	0.5				Water Content 1-81 (31) medium coarse grained sandstone with granules of pumice
					1	1.0				
					2					
					Core Catcher					

Site 286 Hole Core 32 Cored Interval: 586.5-596.0 m

AGE	FORAMS	MANNOS	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
			ABUND.	PRESENCE						
MIDDLE EOCENE					0					
					1	0.5				Water Content 1-49 (35) FELSOPAR, MICARB, NANNO BEARING VITRIC SILTSTONE, olive gray, lithified.
					1	1.0				
					2					
					Core Catcher					

Site 286 Hole Core 33 Cored Interval: 605.5-615.0 m

AGE	FORAMS	MANNOS	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
			ABUND.	PRESENCE						
MIDDLE EOCENE					0					
					1	0.5				MICARB AND NANNO BEARING VITRIC SILTSTONE, dark greenish gray; lithified.
					1	1.0				
					2					
					Core Catcher					

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Site 286 Hole Core 34 Cored Interval: 624.5-634.0 m

AGE	FORAMS	NANNOS	RADS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
MIDDLE EOCENE	Barren			F	0					X-ray 1-12 55% Amor 2% Calc 66% Plag 5% Cryst 3% Quar 29% Mont ALTERED GLASS CLAY, moderate orange pink, with sandy layers brownish black; stiff to semi lithified. SS 1-80 50% Cl (altered glass) 2% Fsp 1% N (-) 46% G1
				R	1	0.5	Empty			56Y 6/1 - 5Y 7/2 5R 8/4 with streaks of 5YR 4/1
				T	1	1.0				ALTERED GLASS SHARD SILTSTONE, moderate to orange pink, stiff to semi lithified. SS 1-110 80% G1 (altered) 5% Fsp 2% S 1% Iron O. (glass may be altered to clay and zeolite) CaCO ₃ 1-111 (0) Water Content 1-111 (17)
				P	Core Catcher					X-ray 1-146 41% Amor 4% Quar 54% Mont 59% Cryst 41% Plag 1% Clin
				R						MANNO BEARING MICARB RICH ALTERED GLASS VITRIC SILTSTONE, medium brown, lithified to soft. SS CC 70% G1 5% N 2% Mag 2% Z 15% M 2% Fsp 2% Norm. 2% S
				P						FELDSPAR BEARING FERRIC OXIDE ALTERED GLASS SHARD CLAYEY SILTSTONE, dark gray; soft to semi lithified. SS CC 55% G1 (altered) 5% Fsp 40% Fer O.

Site 286 Hole Core 35 Cored Interval: 643.5-649.0 m

AGE	FORAMS	NANNOS	RADS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
				F	0					Water Content 1-56 (31) FELDSPAR BEARING ALTERED GLASS VITRIC SILTSTONE, greenish gray, lithified. SS 1-145 5% Fsp 2% Z Water Content 2-14 (28) X-ray 2-77 48% Amor 1% Quar 29% Mont 52% Cryst 71% Plag FELDSPAR AND ALTERED GLASS VITRIC SANDY SILTSTONE, greenish gray; lithified. SS 2-98 59% G1 40% Fsp 1% HM VITRIC TUFF, light gray; lithified. SS 3-18 95% G1 2% Fsp 2% Opaq 1% HM X-ray 3-26 6% Amor 22% Mont 18% Ph1 30% Cryst 4% Plag 8% Clin 1% Goet Water Content 3-85 (22)
				R	1	0.5				MANNO-FELDSPAR BEARING VITRIC SILTSTONE, dark greenish gray; lithified. SS CC 82% G1 3% HM 1% Z 6% Fsp 2% M 5% N 1% Q
				P	Core Catcher					

Site 286 Hole Core 36 Cored Interval: 649.0-656.5 m

AGE	FORAMS	NANNOS	RADS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
				F	0					Basalt Most of the basalt core pieces can be sub- divided into two intercalated types which are most readily distinguished by their color: (1) "black glassy" basalt, dry grayish-black (WZ), wet black (M); dense, very fine- grained, angular, phenocrystic structures. (2) "brown devitrified" basalt; color ranges from dry olive-gray (5Y 4/1) mottled with 'rusty' areas, dry medium brown to dark yellowish brown (5YR 4/4-10R 4/2); characteristic these pieces have variolitic structures up to 2 cm in diameter, and sparse vesicles or calcite amygdulae, < 2 mm. In addition jet-black glass occurs as frag- ments in a dolomite vein at Section 1-40 to 44 cm, in a composite vein with dolomite and opal (?) at Section 1-72 to 75 cm, and as a glass beam 1 cm wide at Section 1-124 to 126 cm. In this section the beam is clearly a clear steep red-brown with a yellowish green. In places the tachylyte is green due to chlori- tization. Sparse calcite and/or chlorite veins, 0.1-1.0 cm occur throughout.
				R	1	0.5	Empty			Chemical analyses - #3 and #4 at Section 1-128
				P	Core Catcher					Chemical analysis - #5 and #6 at Section 1-155

Site 286 Hole Core 37 Cored Interval: 668.5-668.0 m

AGE	FORMS	MANNS	ROADS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
					0		Empty			Basalt As described for Core 36 Section 1. All of the type (2) brown variety.
					1	0.5			*	Chemical analysis on #6 at Section 1-75 Gabbro Diabasic chill zone: dry medium dark to medium light gray (M4-N6) getting lighter down core, wet 'greenish-black' (5G 2/1). The contact between the basalt and gabbro chill zone was not preserved but occurs between two pieces of core. The top of the chill zone is marked by a 1.5 mm green chloritized tachylite, which has flow structures indicating a derivation from the gabbro (thin section). In the 5-7 cm below the glass the rock grades downwards through a variety of textures (fine-grained, fine-grained, and fine-grained) and finally a coarse-grained diabase. The grain-size of the diabase increases rapidly downwards, and at the bottom of Section 1 the average grain-size is ~1.5 mm. Below Section 1 the grain-size increases very slowly. Calcite amygdules, <3 mm, ~1-2% volume. Sparse calcite-chlorite-disseminated pyrite veins, <2 mm.
					2	1.0				Gabbro: dry 'greenish-gray' (5G 6/1), wet greenish-black (5G 2/1). Two pyroxene gabbro: diabasic texture with calcium-rich clinopyroxene and pigeonite forming the groundmass. Plagioclase is interstitial. Euhedral magnetite, 35-45% pyroxene and 5% magnetite. The average grain size gradually changes downwards from approximately 1.5 mm to 2.5 mm. Chloritization of the gabbro appears to extend throughout, with approximately 25% of the primary minerals being replaced. The calcium-rich pyroxene being the most subject to replacement by chlorite. 'Amygdules' are common throughout (although these are probably filled vugs); filled with an unidentified light blue (5G 7/6) or light blue-green soft mineral; <7 mm rarely >4 mm; tend to be concentrated in bands 5-10 cm wide; 1-15% volcanic. Rare serpentine(?) or calcite veins, <2.5 mm wide; often with fine disseminated pyrite (continued on Core 38)
					3					
					4					
					5					
					Core Catcher					

Site 286 Hole Core 38 Cored Interval: 668.0-677.5 m

AGE	FORMS	MANNS	ROADS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
					0					disseminated fine pyrite
					1	0.5				Gabbro like sections Core 37 Sections 2 to 5. Plagioclase crystal habit appears to gradually change from elongate to more tabular. (a vein <3 mm). Pyroxene average grain size <1.5 mm. Rock wet 'greenish black' (5G 2/1), very difficult to estimate color because of coarse grain size.
					2	1.0	Empty			calcite veins, <.5 mm
					3					+ dry dark greenish gray (5G 4/1), wet greenish black (5G 2/1) definite increase in 'greenness' of the rock, probably increased chloritization
					4					Sudden change in color to dry dusty green (5G 3/2). On sawed slab amount of interstitial dark green material noticeably increased relative to Core 37 and Core 38 Sections 1, 2 and 3. Thin section study indicates >50% rock chlorite.
					Core Catcher					

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Site 286 Hole Core 40 Cored Interval: 687.0-696.5 m

AGE	FORAMS	NANNOS	RAIDS	FOSSIL CHARACTER			SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
				ABUND.	PRES.							
							0					Gabbro Like Cores 38 and 39, average grain size ~3-3.5 mm. + chlorite or serpentine or fracture + .7 mm CaCO ₃ veins aragonite(?) + 3 mm CaCO ₃ veins aragonite(?) 10 cm wide oxidized zone with limonite or goethite spots yellowish orange (IDR 6/6) + 1 mm CaCO ₃ vein + .3 mm CaCO ₃ vein
							1	Empty				
							2					
						3						
						4						
						5						
						6						
								Core Catcher				

Site 286 Hole Core 39 Cored Interval: 677.5-687.0 m

AGE	FORAMS	NANNOS	RAIDS	FOSSIL CHARACTER			SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
				ABUND.	PRES.							
							0					Gabbro Similar to Core 38 Section 4. Vugs continue as in Cores 37 and 38, partially to completely filled with very pale blue (5B 8/2, wet) soft unidentified mineral; <1 cm diameter, usually <5 mm; ~2-5% volume of rock. Average grain size of gabbro 2.5-3 mm. Few vugs in Section 4. No vugs in Section 5.
							1	Empty				
							2					
						3						
						4						
						5						
									Core Catcher			

Site 286	Hole	Core 41		Cored Interval: 696.5-706.0 m		LITHOLOGIC DESCRIPTION
		FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	
	AGE					
	FORAMS					
	MANNOS					
	RAIDS					
	FOSSIL ABUND.					
	PRES.					
	SECTION					
		0	0.5		Empty	Gabbro Wet: greenish-black (5G 2/1). Dry: greenish-gray (5G 6/1) with spots of greenish-black (5G 2/1) (chlorite). Sudden drop in grain size, between Core 40 and Core 41. This section shows a sharp alteration has decreased to approximately 25% of the rock. Grain size increases downwards; averaging approximately 3 mm at the bottom of Core 41 Section 6.
		1	1.0			
		2				+ .5 to 1 cm wide oxidized zone similar to Core 4 Section 4 + 2.5 cm wide oxidized zone
		3				+ oxidized zone 1-4 cm wide, with 2 mm goethite(?) vein
		4				+ Below Core 41 Section 4 80 cm vugs filled with soft light green material (like all cores above); <1 cm diameter, 3-8%.
		5				
		6				1 cm wide oxidized zone and chlorite on seam 1 mm CaCO ₃ vein
					Core Catcher	

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DEEP SEA DRILLING PROJECT

LEG 30 SITE 287

SITE SUMMARY SHEET

POSITION: Latitude: 15°54.67'S Longitude: 153°15.93'E

Water depth (from sea level): 4632 corrected meters (Echo sounding)

Bottom felt at: 4653.5 meters (drill pipe) Penetration: 252 m

Number of Holes: 1 Number of Cores: 18

Total length of cored section: 157 meters

Total core recovered: 72.2 meters

Percentage of core recovery: 46.0%

OLDEST SEDIMENT CORED:

Depth below sea floor: 237 meters Nature: Nannofossil chalk

Age: Early Eocene

BASEMENT:

Depth below sea floor: 0.31 seconds (reflection time)

Depth below sea floor: 237 meters

Average velocity to basement: 1.57 km/sec Nature: Basalt flows

PRINCIPAL RESULTS:

Basalt (252-242.4 m); porphyritic basalt (242.4-236.7 m); lower Eocene to lower middle Eocene nannofossil chalk with interbedded chert (236.7-179.3 m); upper Oligocene nannofossil ooze (179.3-171.6 m); unfossiliferous brown silty clay (171.6-171.0 m); unfossiliferous olive to green clay (171.0-131.9 m); lower upper Pliocene to Pleistocene graded rhythms of silt and clay (turbidites) with interbeds of nannofossil ooze.

Site 287 was located adjacent to a basement high in the Coral Sea.

The section is quite similar to that sampled at Site 210 (42 km to the west northwest), but turbidites appear later due to the elevation of the basement ridge, and the regional unconformity spans a larger interval. The basement ridge appears to have developed shortly after the formation of the basin crust in the early Eocene. Early depth of sedimentation was above foram solution depth, but passed below nannofossil solution depth possibly by late Oligocene (certainly early Miocene). The green silty clay

LEG 30 SITE 287
SITE SUMMARY SHEET, con't.

may represent the distal ends of turbidity currents which were depositing graded rhythms at Site 210. The turbidites built to the level of the sea floor at Site 287 in about early late Pliocene time. The thickness of Pleistocene turbidites (about 90 m) is similar at both sites, as is the frequency of deposition (about one flow per 5000 years).

Site 287 Hole Core 2 Cored Interval: 17.5-27.0 m

AGE	FORAMS	NANNOS	RADS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
					0					(Continued from Core 1). GENERALIZED MINERALOGY For Cores 1-7. Graded cycles consist of a maximum of 4 units of different grain size each characterized by a different color.
					1	0.5	Empty			
					2	1.0				1. Basal unit, greenish black (56V 2/1). Esp 20-40% average 32% 0 10-30% average 20% Vol. G1 0-37% average 18% HH 3-15% average 11% Bio. Sed. 0-15% average 9% Minor pyrite, micarb, and clay minerals.
					3					2. Lower middle unit, dark greenish gray (56V 3/1). Cl M. 25-45% average 37% Vol. G1 10-53% average 28% Esp 7-15% average 9% Bio. Sed. 7-11% average 9% Minor pyrite, micarb, micronodules, quartz, zeolite and heavy minerals.
					4					3. Upper middle unit, dark greenish gray (56V 4/1). Cl M. 58-77% average 66% Vol. G1 4-30% average 15% Bio. Sed. 0-17% average 7% Esp 1-5%, average 4% Minor micarb, heavy minerals, micronodules, and zeolite.
					5					4. Top unit, medium dark greenish gray (56V 5/1). Cl M. 49-93% average 75% Vol. G1 0-20% average 8% Bio. Sed. 0-10% average 5% Esp 0-8% average 4% Minor micarb and zeolite. Some top units grad up to nanmo ooze. Nanno interbeds are mainly nannos and clay minerals with small amounts of volcanic glass, forams, micarb, and zeolite. Water Content 2-79 (48) Water Content 3-140 (42) 56V 5/1 medium greenish gray NANNO CLAY; soft-stiff.

Site 287 Hole Core 3 Cored Interval: 36.5-46.0 m

AGE	FORAMS	NANNOS	RADS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
					0					
					1	0.5	Empty			
					2	1.0				GRADED CYCLES AND NANNO CLAY INTERBEDS Too disturbed to recognize the number of graded cycles with confidence. Soft to stiff.
					3					
					4					
					5					FORAM, FELDSPAR AND ALTERED GLASS SHARD BEARING NANNO CLAY; soft - stiff.

Site 287 Hole Core 1 Cored Interval: 0.0-8.0 m

AGE	FORAMS	NANNOS	RADS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
					0					
					1	0.5	Empty			
					2	1.0				MICRONODULE BEARING GLASS SHARD RICH CLAY; soft to stiff. SS 1-116 75% Cl 4% Nod 2% Z 15% G1 2% Esp 2% Py GRADED CYCLES AND INTERBEDS OF BIOGENIC CLAY. CaCO ₃ 3-115 (13) Grain Size 3-124 (0, 43, 57) X-ray 3-131 (Bulk) 24% Quar 15% Plag 4% Mont 24% Mica 5% Chlo 3% Potash Esp. 18% Ca lc 4% Kaol 1% Amph Water Content 3-135 (52) Water Content 5-144 (52) X-ray 6-11 (Bulk) 28% Quar 19% Plag 6% Chlo 5% Potash Esp. 28% Mica 8% Mont 6% Kaol 1% Amph The following comments apply to the sediments in Cores 1 through to the top of Core 8: GRADED CYCLES may consist of a coarsest basal layer of sandy silt grading up through progressively finer silty sediment to silty clay and clay at the top. Sand is rarely seen in a cycle and most cycles consist of a thin basal silt grading up through clayey silt and silty clay to clay. At the top of one cycle the clay grades up into nanmo clay. Average thickness is 28 cm per cycle with a thickness range of 5 to 40 cm. Cycles are usually darker at the base and grade up through lighter colors to the top. Bases are usually greenish black (56V 2/1) to dark greenish gray (56V 3/1) or olive black (5V 2/1) to dark olive gray (5V 3/1). Most of the cycle is usually dark greenish gray (56V 4/1). Occasionally the top is medium greenish gray (56V 5/1). BIOGENIC CLAY. Four distinct beds of nanmo clay can be clearly recognized. Three beds consist of uniform nanmo clay (greenish gray - 56V 6/1 to yellowish gray - 56V 8/1). One bed consists of graded forams-nanno clay to nanmo clay. Bed thickness ranges from 2 to 40 cm averaging about 14 cm. (Continued on Core 2).
					3					
					4					
					5					
					6					MICARB, FELDSPAR AND NANNO BEARING, GLASS SHARD, SILTY CLAY; soft.
					7					56V 4/1 dark greenish gray

*These numbers refer to the number of graded cycles of silt and clay in the indicated intervals.

Site 287 Hole Core 4 Cored Interval: 55.5-65.0 m

AGE	FORAMS	NANNOS	RAOS	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHOLOGIC DESCRIPTION
				ABUND.	PRES.					
LATE PLEISTOCENE	N22			F	C	0				
				F	C	I	0.5	Empty		GRADED CYCLES AND INTERBEDS OF MAMMO CLAY AND CARBONATE SANDY SILT Water Content 1-144 (40)
				N	R		1.0		*	2
				F	R					?
				F	R				3	?
				F	R	2				?
				F	R					?
				F	R				4	?
				F	R					56Y 4/1 dark greenish gray soft.
						Core Catcher			*	

Site 287 Hole Core 5 Cored Interval: 74.5-84.0 m

AGE	FORAMS	NANNOS	RAOS	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHOLOGIC DESCRIPTION
				ABUND.	PRES.					
EARLY PLEISTOCENE	N22			N	R	0				
				F	R	I	0.5		3	1
				F	R		1.0		2/3	?
				F	R					worm burrow filled with pyrite worm burrow filled with pyrite Water Content 2-120 (39)
				F	T	3				?
				N	R					2 worm burrows filled with pyrite X-ray 3-30 (Bulk) 37% Wica 15% Plag 7% Calc 5% Kaol 26% Quar 8% Chlo Water Content 3-85 (33) Grain Size 4-57 (0, 29, 71) CaCO ₃ 4-59 (43) CaCO ₃ 4-67 (38) Grain Size 4-68 (0, 57, 43) Water Content 4-99 (38)
				F	R	4				3?
				N	R					2
				F	R	5				?
				N	R					?
				F	R				3	?
				F	R					56 3/2 dusky green DEVITRIFIED GLASS SHARD ASH, a small patch, probably from a distinct thin bed. SS 6-90 100% G1
				F	R	6			*	?
				F	R					56Y 4/1 dark greenish gray MAMMO, FELDSPAR AND MICARB BEARING GLASS SHARD RICH CLAY; soft.
						Core Catcher			*	

Site 287 Hole Core 8 Cored Interval: 131.5-141.0 m

AGE	FORMAMS	RADS	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
			ABUND.	PRES.					
LATE PLIOCENE			F	C	0				3 thin nanno beds
			N	C	1	0.5		2/3 *	56Y 4/1 SILTY CLAY AND NANNO CLAY INTERBEDS
			F	P	2	1.0			Grain Size 1-2 (0, 24, 76) CaCO ₃ 1-19 (1) X-ray 1-20 (BuIk) 28% Mica 20% Plag 7% Mont 5% Chlo 26% Quar 8% Potash Fsp 5% Kaol 2% Amph OPAQUE, GLASS SHARD BEARING, CLAY RICH, SANDY CLAYEY SILT, dark greenish gray; stiff.
			N	-	3			2/3	10R 5/2 55 1-36 25% C1 5% Opaq 2% Z (yellowish brown) 30% Fsp 5% G1 2% Py 1% G Grain Size 1-42 (1, 26, 73) CaCO ₃ 1-44 (0) X-ray 1-50 (BuIk) 20% Mica 2% Plag 6% Chlo 3% Amph 25% Quar 7% Potash Fsp 5% Mont 2% Kaol MICRONODULE, PYRITE, FELDSPAR BEARING GLASS SHARD RICH SILTY CLAY, dark yellowish brown; stiff, faint moderate mottling at a few levels.
			N	-	4			2	10R 4/2 55 1-52 5% Fsp 3% Hod Tr% Z 72% C1 15% G1 3% Py 2% HM Water Content 1-94 (35) Water Content 3-66 (36)
			F	-	5			1/2	CHLORITE BEARING, FELDSPAR AND ALTERED GLASS SHARD RICH SILTY CLAY, grayish olive; stiff, faint (slightly darker) slight to moderate mottling.
			N	-	6				55 3-70 10% Chlo 2% Hod 44% C1 20% G1 Tr% Z 15% Fsp 2% Opaq ?% Q Grain Size 3-74 (0, 40, 60) CaCO ₃ 3-74 (0)
			F	-	7				5Y 4/1 HEAVY MINERALS, ZEOLITE AND FELDSPAR BEARING ALTERED GLASS SHARD RICH SILTY CLAY; soft -

Site 287 Hole Core 6 Cored Interval: 93.5-103.0 m

AGE	FORMAMS	RADS	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
			ABUND.	PRES.					
LATE PLIOCENE			N	R	1	0.5			Water Content 1-144 (35) GRADED CYCLES AND INTERBEDS OF NANNO CLAY
			F	P	2	1.0		2 *	Water Content 2-120 (37) Water Content 3-100 (37) Grain Size 3-108 (0, 28, 72) CaCO ₃ 3-111 (5) X-ray 3-112 (BuIk) 29% Mica 13% Plag 8% Mont 6% Chlo 23% Quar 10% Calc 7% Potash Fsp 4% Kaol
			N	A	3			7+	Grain Size 3-119 (0, 12, 88) X-ray 3-122 (BuIk) 36% Calc 9% Kaol 4% Mont 22% Quar 2% Arag 3% Potash Fsp 14% Mica 5% Plag 1% Chlo
			F	R	4			2 *	CaCO ₃ 3-122 (30) X-ray 3-126 (BuIk) 28% Quar 12% Plag 3% Kaol 24% Calc 9% Mica 2% Pyri 17% Arag 5% Potash Fsp 1% Chlo
			F	R	5			6	Grain Size 3-122 (0, 65, 35) CaCO ₃ 3-129 (32) Most cycles range from basal silts to silty clays, 3 carbonate cycles range from basal foram silty sands to silt. Water Content 4-69 (33)
			F	R	6			3	Several pyritized worm burrows
			F	R	7			*	5Y 2/1 olive black to BEARING ALTERED GLASS SHARD RICH CLAY; soft. 56Y 6/1 greenish gray

Site 287 Hole Core 7 Cored Interval: 112.5-122.0 m

AGE	FORMAMS	RADS	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
			ABUND.	PRES.					
LATE PLIOCENE			N	R	1	0.5			GRADED CYCLES
			F	P	2	1.0		3	Water Content 1-144 (35) GRADED CYCLES AND INTERBEDS OF NANNO CLAY
			F	R	3			*	5Y 4/1 olive gray FELDSPAR AND MICROR BEARING GLASS SHARD AND NANNO RICH CLAY; soft - stiff.

v denotes very

Site 287 Hole Core 10 Cored Interval: 169.5-179.0 m

AGE	FORMAS	FOSSIL CHARACTERS	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
			0	0.5	Empty			
			1	1.0				
			2					
			3					
			4					
			Core Catcher					

Site 287 Hole Core 9 Cored Interval: 150.5-160 m

AGE	FORMAS	FOSSIL CHARACTERS	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
			0	0.5	Empty			
			1	1.0				
			2					
			3					
			4					
			Core Catcher					

Site 287 Hole Core 11 Cored Interval: 179.0-188.5 m

AGE	FORAMS	NANNOS	RAOS	FOSSIL CHARACTER			SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
				FOSSIL	ABUND.	PRES.						
							0					10YR 5/4 moderate yellowish brown 5Y 7/2 yellowish gray yellowish gray
				R	A	g-	1	0.5			*	Semillithified a few black streaks and spots CLAY AND OPAQUE RICH NANNO CHALK, from thin (1-2 mm) black streak.
				F	C	g-	1	1.0			*	SS 1-62 25% Opaq 20% CI 55% N CALCAREOUS SPICULE AND FORAM BEARING CLAY NANNO CHALK.
				R	T	p-	2					SS 1-130 5% F 2% M 1% Z 53% N 38% CI 3% Calc. S. 1% Py Water Content 2-29 (41)
				R	T	p-	3				*	Faint traces of moderate molluscs. Water Content 3-77 (35)
				R	T	p-	4					GLASS SHARD AND ZEOLITE BEARING CLAY NANNO CHALK. SS 4-25 5% Z 2% M 1% Calc. S. 54% N 33% CI 3% F CaCO ₃ 4-61 (56) Water Content 4-105 (39)
				R	T	f-	5				*	ZEOLITE AND SPONGE SPICULE BEARING CLAY NANNO CHALK. SS 4-125 5% S 1% M 1% F 56% N 31% CI 5% Z 1% Calc. S. Drilling disturbance is slight but sections 5 and 6 were brecciated during splitting. Water Content 5-72 (37)
				N	C	f-						FORAM. AND SPONGE SPICULE BEARING RICH RICH CLAY NANNO CHALK.
				F	C	g-					*	SS CC 20% R 3% F 2% M 31% N 30% CI 5% S

Site 287 Hole Core 12 Cored Interval: 188.5-198.0 m

AGE	FORAMS	NANNOS	RAOS	FOSSIL CHARACTER			SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
				FOSSIL	ABUND.	PRES.						
							0					CaCO ₃ 1-61 (56) Water Content 1-71 (42)
				R	A	g-	1	0.5				5Y 8/1 yellowish gray Semillithified
				F	C	g-	1	1.0			*	FORAM. AND SPONGE SPICULE BEARING CLAY NANNO CHALK. SS 2-53 5% R 3% F 1% S 53% N 30% CI 5% S 2% M 1% Calc. S. Water Content 2-80 (42)
				R	A	g-	3					CLAY NANNO CHALK WITH SILICEOUS RICH BEDS, Light greenish gray. CaCO ₃ 3-53 (58) Water Content 3-53 (40)
				N	C	p-	4				*	FORAM. AND SPONGE SPICULE BEARING RICH RICH CLAY NANNO CHALK. SS 4-73 11% R 3% M 2% Calc. S. 50% N 36% CI 5% S 3% F 1% G Water Content 4-124 (34) CaCO ₃ 5-51 (56) Water Content 5-51 (28)
				R	T	f-	5					FORAM BEARING, MICARB RICH CLAY NANNO CHALK. SS 5-130 12% M 2% Calc. S. 52% N 40% CI 5% F 1% Z ZEOLITE AND FORAM BEARING CLAY NANNO CHALK. SS CC 10% F 2% M 45% N 40% CI 3% Z

Site 287 Hole Core 13 Cored Interval: 198.0-207.5 m

AGE	FORMS	NANNOS	RADS	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
				FOSSIL	ABUND.						
MIDDLE EOCENE	P10	Nannotetrina fulgens (Discosaster striolatus Subzone)				0					
						1	0.5	Empty			Semlithified
				N	C	2	1.0		4		5Y 5/2 light olive gray - CHERT (lithified). 5B 7/1 light bluish gray - CHALKY CHERT (lithified) MICARB BEARING CLAY NANNO CHALK. SS 2-4 55% N (broken) 38% C1 5Y 8/1 yellowish gray Water Content 2-144 (28)
				N	C	3			4		5Y 5/2 - CHERT (lithified). Water Content 3-42 (34) ZEOLITE AND FORAM BEARING CLAY NANNO CHALK; semilithified. SS 3-116 50% N 37% C1 5% F 4% Z 2% M 2% Calc S. 5B 7/1 - CHALKY CHERT (lithified). 5B 7/1 CaCO ₃ core catcher (51) MICARB, CALCAREOUS SPICULE AND FORAM BEARING CLAY NANNO CHALK. SS CC 45% N 41% C1 5% F 3% M 3% Calc S. 1% S

Site 287 Hole Core 14 Cored Interval: 207.5-217.0 m

AGE	FORMS	NANNOS	RADS	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
				FOSSIL	ABUND.						
MIDDLE EOCENE		Discosaster subloedenis (Rhabdosphaera inflata Subzone)				0					
						1	0.5	Empty			Water Content 1-114 (33) CLAY NANNO CHALK; semlithified.
				N	C	2	1.0		1		Mottling moderate but faint. A few ZOOPLYCOS burrows. CaCO ₃ 2-80 (67) Water Content 2-80 (38)
				N	C	3			4		CaCO ₃ 3-5 (56) Water Content 3-80 (32) X-ray 3-100 (Bulk) 84% Calc 5% C1n 3% Mica 3% Mont 1% Plag FORAM, MICARB, CLAY AND CALCAREOUS SPICULE BEARING, ZEOLITE RICH NANNO CHALK. 56Y 8/1 light greenish gray 55% CC 51% N 25% Z 8% Calc S. 5% M 7% C1 4% F 1% G1

Site 287 Hole Core 15 Cored Interval: 217.0-226.5 m

AGE	FORMS	NANNOS	RADS	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
				FOSSIL	ABUND.						
LOWER EOCENE	P9	Discosaster subloedenis * *				0					
						1	0.5	Empty			Water Content 1-88 (33) CaCO ₃ 1-91 (68)
				N	C	2	1.0		4		Semlithified Water Content 2-16 (32) CaCO ₃ 2-141 (55) HEAVY MINERAL MICARB AND PYRITE BEARING, ZEOLITE AND CLAY RICH NANNO CHALK (from black streak). SS 2-27 53% N 15% Z 5% M 5% PY 3% HM 2% Calc S. 5G 8/1 light greenish gray FORAM AND MICARB BEARING, ZEOLITE AND CLAY RICH NANNO CHALK. 56 8/1 SS CC 48% N 25% C1 15% Z 5% M 5% F 2% Calc S.

* * (Discosasteroides kauppi Subzone)

Site 287 Hole Core 18 Cored Interval: 242.5-252.0 m

AGE	FORAMS	NANNOS	RADS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
					0		Empty			<p>PORPHYRITIC BASALT continued.</p> <p>Like Core 16, average groundmass plagioclase ~0.2-0.25 mm.</p> <p>chemical analysis #10</p> <p>BASALT</p> <p>Dry medium to medium dark gray (N5-N4), wet grayish black (N2).</p> <p>Very fine-grained basalt with sparse phenocrysts of plagioclase (<0.25 mm) and olivine (<0.25 mm) visible in hand specimen. Olivine (not interstitial texture, with chlorite groundmass around the plagioclase microclites. Chloritic alteration has destroyed all of the groundmass plagioclase varies from <30µ at the top (chill-zone) to ~0.20-0.25 mm at the bottom of Section 1.</p> <p>Chlorite and sparse calcite amygdules; abundant calcite and/or chlorite veins.</p>
					1	0.5 1.0				

Site 287 Hole Core 16 Cored Interval: 236.0-238.0 m

AGE	FORAMS	NANNOS	RADS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
LOWER EOCENE					0		Empty			<p>Water Content 1-42 (27)</p> <p>CaCO₃ 1-49 (50)</p> <p>CHALK CHERT (lithified).</p> <p>OPAQUE, ZEOLITE MICARE AND GLASS SHARD BEARING CLAY NANNO CHALK; semi-lithified, olive gray (5Y 4/1), moderate to intense burrowing (flattened).</p> <p>SS 1-68.5 45% N 7% G 3% Z 37% CI 5% M 3% Opag</p> <p>PORPHYRITIC BASALT</p> <p>72-78 cm: dry pale purple (5P 6/2), wet medium gray (N5).</p> <p>79-150 cm: dry medium light gray (N6), wet dark gray (N3).</p> <p>~15-20% plagioclase phenocrysts and glomerocrysts, ~5 mm (long axis).</p> <p>~5% serpentine-calcite pseudomorphs after olivine phenocrysts, ~2 mm diameter, <2%.</p> <p>Groundmass plagioclase increases downwards from ~0.2 mm at top of an average of 0.20-0.25 mm at the bottom of Section 1. Considerable replacement of groundmass glass(?) and pyroxene by chlorite. Interstitial texture.</p> <p>Abundant calcite and/or chlorite veins, <3 mm wide.</p>
					1	0.5 1.0				
							Empty			
							Core Catcher			

Site 287 Hole Core 17 Cored Interval: 238.0-242.5 m

AGE	FORAMS	NANNOS	RADS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
					0		Empty			<p>PORPHYRITIC BASALT continued.</p> <p>Like basalt of Core 16.</p> <p>CORE CATCHER - PORPHYRITIC BASALT continued.</p> <p>No amygdules or vesicles in middle part of core catcher; rock very fresh.</p> <p>olivine phenocrysts 5.0</p> <p>olivine glomerocrysts 15.0</p> <p>plagioclase groundmass 25.6</p> <p>groundmass pyroxene 48.0 (~3% was groundmass olivine)</p> <p>magnetite 4.0</p> <p>chloritic alteration 4.0</p> <p>chlorite amygdules 0.4 (250 points)</p> <p>Increase of chlorite amygdules to ~5%, <2 mm diameter</p> <p>chemical analysis #9</p>
					1	0.5 1.0				
					2		Void			
					3					
							Core Catcher			

DEEP SEA DRILLING PROJECT

LEG 30 SITE 288

SITE SUMMARY SHEET

POSITION: Latitude: 5°58.35'S Longitude: 161°49.53'E

Water depth (from sea level): 3000 corrected meters (Echo sounding)

Bottom felt at: 3030 meters (drill pipe) Penetration: 288-238 m
288A-988.5 m
288B-150 m
288C-117 m

Number of Holes: 4 Number of Cores: 288-11; 288A-30; 288B-1; 288C-1

Total length of cored section: 288-98 m; 288A-284.5 m; 288B-3 m;
288C-4.5 m

Total core recovered: 288-50.4 m; 288A-61.3 m; 288B-3 m; 288C-4.5 m

Percentage of core recovery: 288-51%; 288A-22%; 288B-100%; 288C-100%

OLDEST SEDIMENT CORED:

Depth below sea floor: 988.5 meters Nature: Cherty limestone

Age: Aptian

PRINCIPAL RESULTS:

The lithologic succession at Site 288 is in ascending order: Early Cretaceous (Aptian) to lower Paleocene nannofossil chalk and limestone with interbeds of chert, vitric clay, and siltstone (988.5-500 m); lower Oligocene to Pleistocene foram-nannofossil ooze and chalk with nodular chert from Miocene downwards.

The site was located on the southeastern flank of the Ontong Java Plateau. Basement was not reached, but a comparison to Site 289 suggests that the oldest sediments (Aptian) may not have been far above it.

Following crustal formation in pre- or early Aptian time, biogenic and minor volcanogenic sediments accumulated. Maximum depth was reached in the Campanian. The depth remained relatively constant into late Oligocene time. The section is discontinuous, with a major hiatus in the Eocene and early Oligocene. Reworked sediments suggest that the site has been an unstable surface of gentle inclination - probably within a topographic low - which has been subject to current scour and minor slumping from Aptian to Miocene. More intense disturbances have occurred from the late Miocene on.

56
LEG 30 SITE 288
SITE SUMMARY SHEET, con't.

Ash in the upper Pliocene is probably related to volcanism on the Stewart arch and the Roncador homocline. The Miocene/Pliocene hiatus may mark slumping associated with tectonism.

Site 288 Hole Core 1 Cored Interval: 0.0 to 3.0 m

AGE	FORAMS	MANNOS	RAOS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHOLOGIC DESCRIPTION
					0				
					1	0.5		5	SPONGE SPICULE BEARING FORAM-MANNO OOZE, brown with swirls of pale brown (10YR 6/3); soupy; no structures.
						1.0		3/5	SS 1-90 55% N 3% S 2% ST 1% HM 35% F 2% R 1% D Tr% GI
					2			*	FORAM-RICH MANNO OOZE, light gray; soft; no structures.
									SS 1-140 78% N 2% R 1% HM 15% F 2% S 1% GI 1% Esp
								3	CaCO ₃ 2-50 (76)
								CC	FORAM-MANNO OOZE, pale brown; soupy to soft.
									SS 2-70 45% F 2% S 2% R 1% HM 1% D
									Grain Size 2-83 (7.4, 38.4, 54.2)
									X-ray 2-122 32% Amm 97% Calc 68% Cryst 1% Quar HEAVY-MINERAL-FORAM BEARING MANNO OOZE, light gray; soft.
									SS 2-146 86% N 4% HM 7% F 2% R 1% S
									RAD-BEARING, FORAM-RICH MANNO OOZE, light gray.
									SS CC 72% N 5% R 13% F 2% ST 1% HM Tr% GI

Site 288 Hole Core 2 Cored Interval: 10.0-19.5 m

AGE	FORAMS	MANNOS	RAOS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHOLOGIC DESCRIPTION
					0				
					1	0.5			MANNO-FORAM OOZE, light gray; soft.
						1.0			SS 1-148 50% F 2% ST 45% N 1% S Tr% GI
								2 *	Empty
								10YR 7/2	
									FORAM-BEARING, MANNO OOZE, light greenish gray; soft.
									SS 3-57 88% N 10% F 1% GI 1% R
									10YR 8/1 Swirled with 5Y 7/1
									MANNO-FORAM OOZE, light gray; soupy.
									SS 3-130 60% F 1% HM 35% N 1% GI 1% S 1% ST
									Water Content 4-144 (44.29)
									X-ray 5-35 67% Amm 36% Cryst 1% Quar 3% Aug1
									FELDSPAR-BEARING, MAGNETITE-VOLCANIC GLASS ASH, black (5Y 2.5/1), very fine sand layer, black pumice pebble, 1.5 x 1.5 cm.
									SS 5-36 48% GI 40% Mag 10% Fsp 2% HM
									Water Content 5-93 (40.58)
									Water Content 5-95 (40.69)
									FORAM-MANNO OOZE, light gray; soft.
									SS 5-95 62% N 1% R 35% F 1% S Tr% GI Tr% HM
									5Y 6/1
									swirled
									FORAM-CALCAREOUS SPICULE-BEARING, MANNO OOZE, light gray.
									SS CC 81% N 10% Calc S 1% GI 1% HM

Site 288 Hole Core 6 Cored Interval: 86.0-95.5 m

AGE	FORMS	NANNOS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
LATE MIOCENE				0					
				1	0.5		5		FORAM-NANNO OOOZE, same lithology as above, light gray; soupy. Water Content 1-121 (37.17) Grain Size 2-60 (6.9, 41.2, 51.9)
				2	1.0		3		Water Content 2-70 (37.30) CaCO ₃ 2-100 (95) X-ray 2-120 8% Amor 92% Cryst 100% Calc NANNO-FORAM OOOZE, light gray; soft. 55.2-140 50% F 48% N 1% R 1% S
				3					Water Content 3-65 (35.72) Grain Size 4-44 (6.8, 41.2, 52.0) Water Content 4-88 (37.63) Grain Size 4-120 (7.0, 46.1, 44.9)
				4					FORAM-NANNO OOOZE, very light gray; soft. 58% N 40% F 1% R 1% S
				5					Water Content 5-74 (35.13) Water Content 5-144 (35.99) ZEOLITE AND CHLORITE-ALTERED VOLCANIC ROCK FRAGMENT, green granule at Section 6-10.
				6					SS 6-10 60% G 40% Z Tr% Fsp NANNO AND CLEAR GLASS-SHARD-BEARING, ALTERED GLASS-SHARD OPAQUITE (black), patch at Section 6-39. SS 6-38 4% Opaq 5% G Tr% D 40% A, G 2% Fsp Tr% R 8% N Tr% HM Tr% S Water Content 6-85 (41.71) FORAM-RICH NANNO OOOZE, white. SS CC 78% N 2% R 1% G 1% S 15% F 1% Fsp 1% Z 1% S

Site 288 Hole Core 5 Cored Interval: 67.0-76.5 m

AGE	FORMS	NANNOS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
LATE PLEISTOCENE				0					
				1	0.5		3		N7 Water Content 1-60 (39.48) NANNO-FORAM OOOZE, light gray; stiff; pumice pebble at Section 1-80. SS 1-105 55% F 55% N 1% HM Tr% S FORAM-NANNO-RICH OOOZE (patch) - greenish gray (56.471). SS 1-146 70% N 30% F Tr% G Tr% HM FORAM-NANNO-OOZE, light gray; stiff. Black pyritic streaks at Section 2-50 to 65, 65 to 70 cm. Water Content 2-75 (38.30) Water Content 3-50 (39.85) CaCO ₃ 3-85 (77) Grain Size 3-87 (9.9, 31.8, 58.4) Greenish gray (56.471) streaks at Section 3-62, 70. RAD-BEARING, FORAM-NANNO-OOZE, medium to light gray; stiff. SS 3-120 65% N 30% F 5% R 1% S
				2	1.0		3		Grayish green (56.5/2) patch at Section 4-10. Water Content 4-40 (40.15) X-ray 4-67 8% Amor 98% Calc 1% Plig 8% Cryst 1% Quar FORAM-NANNO-OOZE, medium to light gray; stiff. SS 4-120 67% N 1% HM 1% S 40% F 1% Py
				3					FORAM-BEARING, NANNO-RICH OPAQUE VOLCANIC ASH, black (Streaks). SS 5-11 42% G 21% N 2% Fsp 1% S 30% Opaq 3% F 1% R Water Content 5-122 (42.22) FORAM-NANNO-OOZE, gray; stiff. SS 5-140 59% N 1% Py Tr% S 40% F Tr% R
				4					Water Content 6-90 (42.96) FORAM-NANNO OOOZE, light gray. SS CC 55% N 2% S 1% G 1% Opaq 40% F 1% R 1% Opaq
				5					
				6					
				Core Catcher					

Site 288 Hole Core 10 Cored Interval: 200.0-209.5 m

AGE	FORAMS	NANNOS	RADS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
					0					
					1	0.5	Empty			
					2	1.0				
					3					
					4					
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Site 288 Hole A Core 1 Cored Interval: 267.0-278.5 m

AGE	FORMAS	NANNOS	RADS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
P22				F a f	0	Empty	Empty	5		Chert pebble, yellowish brown (10YR 5/4) to dark brown (10YR 4/3), translucent, at Section 1-35.
P22				R a g	1	0.5		*		ANDESITE GRANULE, well-rounded, at Section 1-35.
				N C m	2	1.0		0		SS 1-35 85% PtAg (AN) ₁₀₋₄₀ 15% Pyrox CALCAREOUS SPICULE-BEARING NANNO CHALK, white; semilithified, slightly mottled with very light gray.
					2			0		87% N 10% Calc S. 2% F 1% S Water Content 1-122 (29.77)
					3			0		FELDSPAR-ZEOLITE-BEARING CLAY LUMP, dark grayish brown (10YR 4/2).
								0		SS 2-75 85% N 10% Z 5% Fsp Water Content 2-127 (29.37)
								0		Water Content 3-56 (29.63)
								0		CALCAREOUS SPICULE-RICH, NANNO CHALK, white, slightly mottled, parallel laminae at Section 3-80 and 100.
								0		SS 3-140 78% N 20% Calc S. 1% F 1% R CALCAREOUS SPICULE-FORAM-BEARING, NANNO-CHALK, white.
								0		SS CC 76% N 10% Calc S. 1% Z 10% F 2% G1 1% S

Site 288 Hole A Core 2 Cored Interval: 305.0-314.5 m

AGE	FORMAS	NANNOS	RADS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
P22				F a g	0	Empty	Empty	5		FORAM-BEARING, CALCAREOUS SPICULE-RICH NANNO OOZE, white; semilithified, moderate mottling.
					1	0.5		0		SS 1-130 75% N 5% F 1% M 1% SI 15% Calc S. 2% Z 1% R Water Content 1-144 (23.38)
					2			0		ASH, dark gray (N3) CALCAREOUS SPICULE-RICH, NANNO CHALK, very light gray; semilithified, intensely mottled (very light gray and light gray).
								0		SS 2-30 80% N Tr% G1 Tr% R 20% Calc S. Tr% Py Water Content 2-134 (29.05)
								0		CALCAREOUS SPICULE-BEARING NANNO CHALK, white (N9).
								0		SS CC1 92% N 5% Calc S. 2% F 1% R NANNO-BEARING GLASS SHARD TUFF, black.
								0		SS CC2 93% G1 5% N 1% Chlo. 1% R

Site 288 Hole A Core 3 Cored Interval: 343.0-352.5 m

AGE	FORMAS	NANNOS	RADS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
P21				F C g	0	Empty	Empty	0		CHERT, very dark gray (10YR 3/1-3/3) to light to dark gray to dark brown (10YR 6/1-4/1), very thin parallel laminae.
				R C g	1	0.5		0		GLASS SHARD-BEARING, NANNO CHALK, white, faintly mottled.
				F C g	2	1.0		0		NANNO GLASS-SHARD TUFF, grayish black; semilithified, intensely mottled (with light gray), occurs as streaks.
				R C p				0		SS 1-133 50% G1 1% Opaq Tr% F 39% N Tr% Py Water Content 1-144 (25.75)
				F C g				0		NANNO CHALK, white; semilithified, intensely mottled.
				R a g				0		Water Content 2-119 (26.67)
				R a g				0		CaCO ₃ 2-132 (95)
								0		SS CC 92% N 5% G1 2% S 1% Fsp

Site 288 Hole A Core 4 Cored Interval: 381.0-390.5 m

AGE	FORMAS	NANNOS	RADS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
P21				F C f	0	Empty	Empty	0		FORAM-NANNO CHALK, white; semilithified, intensely mottled, steeply dipping at ~50° on cut surface (true dip >60°).
				R a g	1	0.5		0		FORAM-NANNO CHALK, white; semilithified, thin parallel laminae (dipping 45°) overlain by cherty chert (paper yellow) at Section 2-35 to 47. Thin laminae at Section 2-85.
				F C f	2	1.0		0		SS 2-40 60% N 40% F Tr% Z Tr% R Water Content 2-112 (30.92)
				F C g				0		CHERT fragment, core badly scored.
				N C m				0		CALCAREOUS SPICULE-BEARING, NANNO-FORAM CHALK, white.
								0		SS CC 92% N 10% Calc S. 2% Z 1% S 32% N 2% R 1% G1

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Site 288 Hole A Core 5 Cored Interval: 419.0-428.5 m

AGE	FORAMS	NANNOS	RADS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
?	P20		Theocypris tuberosa		0	0.5	Empty		NANNO CHALK, white, light gray, very light gray, parallel laminae at Section 1-70, intense bioturbation cut with low-angle fractures, and displacements, producing breccia at Section 1-82 to 93, mottled. CHERT, fragment, at Section 1-80, olive brown. Water Content 1-118 (25.98)
?			Discosyrinx dilatens		1	1.0			
					2				
					3				
					Core Catcher				
									NANNO CHALK, white (N9). SS CC 97% N 1% R 1% S

Site 288 Hole A Core 6 Cored Interval: 457.0-466.5 m

AGE	FORAMS	NANNOS	RADS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
EARLY OLILOCENE	P19		Theocypris tuberosa		0	0.5	Empty		NANNO-CHALK, white (N9), semilithified; mottled, light gray at Section 1-10 and dark gray at Section 1-40, bioturbated at Section 1-105. CaCO ₃ 1-71 (97) X-ray 1-77 7% Amor 93% Cryst 100% Calc Water Content 1-83 (28.26) CHERT fragment, light gray (N7) at Section 1-120. Water Content 1-144 (27.50)
					1	1.0			
					2				
					4				
					Core Catcher				
									NANNO CHALK, white (N9). SS CC 97% N 1% Z 1% GI 1% Esp CHERT, Pale dark gray (N3).

Site 288 Hole A Core 7 - 495.0-504.5 m: EMPTY.

Site 288 Hole A Core 8 Cored Interval: 533.0-542.5 m

AGE	FORAMS	NANNOS	RADS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
?			Cruciplacolithus tenuis C. robusta ?H. Kleinpellit		0	0.5	Empty		NANNO-FORM CHALK, intense, white; semi-lithified. SS 1-120 60% F 40% N Tr% G1 Crystalline, brown, translucent particles at Section 1-143 (smear slide), (hematite?). Water Content 2-56 (31.73) CaCO ₃ 2-63 (98) X-ray 2-65 6% Amor 94% Cryst 100% Calc ZEOLITE-BEARING, FORAM-RICH NANNO CHALK; light brownish gray (10VR 6/2) with white blebs; semilithified.
					1	1.0			
					2				
					Core Catcher				
									SS 2-127 67% N 25% F 8% Z ZEOLITE-FORAM-RICH NANNO CHALK, light brown (7.5R 6/3), with white blebs; semilithified. SS 2-130 65% N 20% F 15% Z CHERT, dark reddish brown (5VR 2.5/2) with light reddish brown blebs (5VR 6/4). CaCO ₃ 2-144 (97) X-ray 2-146 10% Amor 90% Cryst 100% Calc FORAM-RICH NANNO CHALK, white. FORAM BEARING, NANNO CHALK, white (N9). SS CC 87% N 7% F 2% Py 2% Opaq 1% R

Site 288 Hole A Core 9 Cored Interval: 571.0-580.5 m

AGE	FORAMS	NANNOS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHOLOGIC DESCRIPTION
MIDDLE MASTRICHTIAN				0				
				1	0.5			N9 Water Content 1-66 (27.73) CALCAREOUS SPICULE-BEARING, MANNO CHALK, white; semilithified. SS 1-102 88% N 10% Calc S. 2% F Tr% Esp CHERT fragment, 4 cm in diameter, black (5YR 2.5/1) to reddish black (10R 2.5/1) with dark brown blebs at Section 1-115.
				2	1.0			N9 MANNO CHALK, white; semilithified. Water Content 1-144 (28.24) CHERT, very dark brown (10YR 3/2) and brown to grayish brown (10YR 5/3 to 5/2). MANNO OOZE, white (N9), grades from stiff at Section 2-20 to soft at Section 2-150.
				3				N8 CaCO ₃ 3-20 (98) FORAM-BEARING MANNO OOZE, white, medium gray streaks at Section 3-95, 123, 138, soft. CHERT fragment, brown, at Section 3-137.
				4				N9 OPAQUE-ZEOLITE AND SHELL-FRAGMENT-BEARING, FORAM RICH MANNO OOZE occurring as medium gray to medium light gray streaks, at Section 4-85, 100, 110, and 120 to 150. SS 4-146 72% N 5% Shell 3% Opaq 15% F 5% Z(?) X-ray 5-114 4% Amor 98% Cryst 100% Calc SHELL-FRAGMENT-BEARING, FORAM-MANNO OOZE, white; soft. 10YR 8/1 SS 5-124 67% N 30% F 3% Shell X-ray 6-85 2% Amor 98% Cryst 100% Calc
				5				
				6				FORAM-BEARING, CALCAREOUS-SPICULE-RICH, MANNO-CHALK, white (N9). SS CC 75% N 20% Calc S. 5% F CHERT, olive brown (2.5Y 3/4).
				Core Catcher				

Site 288 Hole A Core 10 Cored Interval: 609.0-618.5 m

AGE	FORAMS	NANNOS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHOLOGIC DESCRIPTION
EARLY MASTRICHTIAN				0				
				1	0.5			N9 CHERT, nodule 8 x 6 x 2.5 cm, black (5YR 2.5/1) slightly mottled. Water Content 1-6 (27.46) MANNO CHALK, white; semilithified. SS 1-40 97% N 2% M 1% F CaCO ₃ 1-86 (96) X-ray 1-89 1% Amor 99% Cryst 100% Calc CLAY, dark grayish brown (10YR 4/2), lamina. SS 1-100 100% Clay MANNO CHALK, white, mottled with very pale brown (10YR 7/3); semilithified. SS 1-130 96% N 2% F 2% M Tr% Calc R.
				2	1.0			MANNO CHALK + MANNO OOZE, interbedded and arranged on cyclic color bands in interval Section 2-30 to 100. Color bands alternate white (10YR 8/2) and light gray (10YR 7/1). A typical alternation starts with a basal chalk contact overlain by white ooze or ooze grades up into light gray chalk overlain by 3-5 cm thin-bedded cycles occur averaging 10 cm. Thin-bedded cycles upper 30 cm consists of light gray (2.5Y 7/2) whereas lowest 20 cm consists of intense white (N9) ooze. Water Content 2-106 (26.45) Intense mottled zone at Section 2-115. CALCAREOUS SPICULE RICH, MANNO OOZE, white (N9). SS CC 72% N 25% Calc S. 2% M 1% S
				Core Catcher				

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Site 288 Hole A Core 13 Cored Interval: 704.0-713.5 m

AGE	FORMS	NANNOS	RAOS	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHOLOGIC DESCRIPTION
				ABUND.	PRES.					
?						0				NANNO-CHALK, white (N9), and very light gray (N8); semilithified, disturbed laminae at Section 1-145. SS 1-140 10% F 2% Calc S. Alternates with pieces of CHERT, dark grayish brown (10% N/2) at Section 1-130, black (5% N) at Section 1-140, and dark reddish brown (5% R 3/2) at Section 1-148 where it interdigitates with overlying chalk. Water Content 1-144 (17.37) NANNO 00ZE, white, with green spots. SS CC 99% N Tr% Z Tr% Opaq CHERT, dark brown (7.5 YR 3/2).
SANTONIAN						1	0.5-1.0	Empty		
						Core Catcher				

Site 288 Hole A Core 14 Cored Interval: 723.0-732.5 m

AGE	FORMS	NANNOS	RAOS	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHOLOGIC DESCRIPTION
				ABUND.	PRES.					
?						0				CaCO ₃ 1-106 (88) NANNO CHALK, intense white (N9+) to very light gray (N8); semilithified to stiff. SS 1-145 97% N 1% F 1% Calc S. Tr% S CHERT, very dark gray (N2) at Section 1-95 to 98. NANNO CHALK, white (N9). SS CC 98% N 2% Calc S.
SANTONIAN						1	0.5-1.0	Empty		
						Core Catcher				

Site 288 Hole A Core 11 Cored Interval: 647.0-656.6 m

AGE	FORMS	NANNOS	RAOS	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHOLOGIC DESCRIPTION
				ABUND.	PRES.					
?						0				CALCAREOUS SPICULE-RICH, NANNO CHALK, white; semilithified; small fault at Section 1-70 to 75, vertical dark streaks at Section 1-75 to 100. SS 1-130 11% Calc S. Tr% Z Tr% Opaq Water Content 1-135 (27.41) Water Content 1-144 (26.64) NANNO CHALK-OOZE, white, to light gray; bioturbated at Section 2-70 to 77. ZEOLITE-HEAVY MINERAL RICH NANNO CHALK, black spot. SS 2-69 20% Z 2% M 51% N 25% HM 2% Fsp AUTHIGENIC CARBONATE AND NANNO BEARING CLAY, black. SS 2-91 5% N 3% A. Carb 2% M 90% CT X-ray 2-92 2% Dolo 3% Mont 48% Amor 6% Quar 60% Paly 52% Cryst 22% Calc 6% Mica 1% Cltn NANNO CHALK, white (N9). SS CC 1 98% N 2% Ca CALCAREOUS SPICULE-BEARING, PYRITE-RICH, OPAQUE-NANNO OOZE, black, occurs as a black spot. SS CC 2 30% Opaq 20% Py 15% Calc S. 35% N
CAMPANIAN						1	0.5-1.0	Empty		
						2				
						Core Catcher				

Site 288 Hole A Core 12 Cored Interval: 685.0-694.5 m

AGE	FORMS	NANNOS	RAOS	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHOLOGIC DESCRIPTION
				ABUND.	PRES.					
?						0				Water Content 1-82 (24.75) NANNO CHALK, light gray; semilithified. SS 1-84 97% N 2% M 1% A. Carb FELDSPAR-ZEOLITE, CARBONATE AND OPAQUE-BEARING CLAY NANNO CHALK, very dark gray fragment 1.5 x 1.0 cm. SS 1-91 10% Opaq 4% Carb 1% Calc R. 48% N 30% C 4% Z 3% Fsp OPAQUE-BEARING, NANNO CHALK, grayish brown (10YR 5/2) fragment 4 x 4 cm. SS 1-142 3% Opaq 97% N CHERT, black. CHERT, dark reddish gray (5YR 4/2), black (2.5Y 2/1).
CAMPANIAN						1	0.5-1.0	Empty		
						Core Catcher				

Site 288 Hole A Core 15 Cored Interval: 761.0-770.1 m

AGE	FORMS	NANNOS	FOSSIL CHARACTER	PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
?					0		Empty			CHALK, grading to LITHOGRAPHIC LIMESTONE at Section 1-115 to 120, pale yellowish white (5Y 5/2) to white (5Y 8/1); yellowish brown lamina areas incidentally silicified zone. Water Content 1-129 (15-97)
					1	0.5	Empty			ZEOLITE-BEARING, NANNO CHALK, pale yellowish to light pale yellow gray; semi-lithified, intensely mottled and bioturbated.
					2	1.0	Empty			SS 1-130 68% N 2% Z 1% HM 1% Nod Water Content 1-145 (13-97)
										Water Content 2-42 (21-33)
										CHALK; pale yellow white (2.5Y 8/2) to light-pale yellowish gray, white, very pale brownish white; semilithified, laminated, flaser-bedded, lenticular-bedded, mottled, bioturbated.
										NANNO CHALK, burrow fill in white limestone.
										SS 2-105 99% N Tr% Opq
										VOLCANIC GLASS, OPAQUE AND CLAY BEARING ZEOLITE RICH NANNO CHALK, lamina, dark brown.
										SS 2-116 68% N 2% Z 3% Opq 3% Gt 1% Chlo 5% C1 2% Nod 1% HM
										CHERT, dark reddish brown (2.5R 3/4) at Section 2-41 and Section 2-105 to 107.
										LITHOGRAPHIC LIMESTONE, very pale brownish white (10YR 8/2) to pale brown (10YR 8/4) band, dense, lithified, with siliceous blebs at Section 2-92 to 98.
										FELOSPAR-CHLORITE-PYRITE, CARBONATE, CLAY, GLASS-SHARD-ZEOLITE-BEARING NANNO LIMESTONE.
										SS CC1 47% N 10% C1 10% Z 5% Carb 5% Py 5% Fsp 1% HM
										CHERT, dusky red (10R 3/3), weak red (10R 4/4).
										NANNO CHALK, white (N9).
										SS CC2 97% N 2% Py 1% Fsp

v denotes very

Site 288 Hole A Core 16 Cored Interval: 780.0-789.5 m

AGE	FORMS	NANNOS	FOSSIL CHARACTER	PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
					0		Empty			CHALK, pale brownish white (10YR 8/2) to dark brown (10YR 4/3), with ASH-SILTSTONE laminae (border has irregularly rough-out; semilithified, parallel laminae); irregular laminae, Section 1-50 to 85.
					1	0.5				FELOSPAR-OPAQUE-BEARING, NANNO-ZEOLITE-RICH GLASS-SHARD SILTSTONE, laminae, dark brown.
										SS 1-72 30% Gt 20% Z 3% Fsp 3% N 5% Opq 1% Nod 1% S
										Water Content 1-94 (14-59)
										X-ray 1-97 53% Amor 3% Quar 10% Plag 47% Cryst 56% Calc 4% Mont 3% Bari
										At Section 1-85 to 120: interlaminated CHALK and ASH-SILTSTONE, pale brown to very dark grayish brown; semilithified, thin laminae, irregular laminae, bioturbated (slight), FELOSPAR, PYRITE, CLAY + ZEOLITE-BEARING, VOLCANIC GLASS RICH, NANNO SILTSTONE, laminae, dark brown.
										SS 1-96 62% N 15% Gt 5% C1 4% Py 4% Fsp
										CaCO3 1-99 (68)
										X-ray 1-100 34% Amor 88% Calc 82% Cryst 10% Quar
										At Section 1-120 to 150: interbedded NANNO CHALK, white (10YR 8/1), and GLASS-SHARD SILTSTONE, dark gray; semilithified, irregularly graded, FELOSPAR-HEAVY WATER BEARING ZEOLITE-RICH GLASS-SHARD, SANDY SILTSTONE, dark gray, laminae.
										SS 1-131 52% Gt 30% Z 7% HM 2% N 5% Fsp 2% Opq 1% Nod
										X-ray 1-131 56% Amor 4% Quar 44% Cryst 3% Calc 4% Mica 35% Clin
										CHERT at Section 1-55 (reddish brown-dark reddish brown), Section 1-80, 135, and 145 (dark reddish brown).
										CHERT, light yellowish brown (10YR 6/4) and dark brown (10YR 4/3).
										NANNO CHALK, light gray (5Y 7/2) to light olive gray (5Y 6/2).
										SS CC1 98% N 2% M Tr% Opq
										CLAY-CHLORITE-PYRITE-FELOSPAR-BEARING NANNO-ZEOLITE RICH CARBONATE SILTSTONE, dark gray laminae.
										SS CC2 30% Carb U. 20% N 5% Chlo 5% Py 25% Z

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Site 288 Hole A Core 20 Cored Interval: 846.5-856.0 m

AGE	FORAMS	NANNOS	RADS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
					0		Empty			
					1	0.5				FORAM-MANNO CHALK, white (N9) to light gray (N8); semilithified, interbedded with CHERT, dark reddish brown (2.5YR 3/4), and light gray (5Y 6/1.5). Water Content 1-53 (16.47)
				F	1	1.0				FORAM-MANNO CHALK, light greenish gray (5G 7/1), laminated with SILTSTONE, greenish gray (5G 6/7), thinly laminated, slight grading.
					2					SS 1-101 70% N Tr% Chlo Tr% Fsp HEAVY MINERAL, MANNO-ZEOLITE-GLAUCONITE-BEARING, MANNO RICH, GLASS-SHARD, SILTSTONE, greenish gray (5G 6/7) laminae.
				F	2					SS 1-121 5% G 3% IM 5% Z 2% Fsp 25% N CHERT, dark reddish brown (5YR 3/3), dark brown (2.5YR 3/2), dark grayish brown (10YR 4/2).
					3					Water Content 1-144 (11.49) At Section 1 140 to 147 interbedded CHERT, dark brownish gray (10YR 4/2), gray (10YR 5/5), dusky (2.5YR 4/2), light olive gray (5Y 7/1), dark reddish brown (5YR 3/2), laminated, lenticular, or as a cap on chalk at Section 2-16 to 22, 80 to 93, and 149 with FORAM-BEARING MANNO CHALK, white (N9), very light gray (N8); lithified, laminated, with dark greenish gray (5G 4/4) and greenish gray (5G 6/7) SILTSTONE laminae.
				N R P	Core Catcher					Water Content 2-46 (11.66) CaCO ₃ 2-71 (83) Water Content 2-134 (13.49) SILICIFIED LIMESTONE, light gray (N8); lithified, dense, aphanitic, with parallel laminae (dark greenish gray) at Section 3-35 to 50 and 95 to 100. Chert bleb at Section 3-68. Water Content 3-116 (16.72) X-ray 3-129 65% Amor 80% Calc 6% Cris 1% Bari 35% Cryst 11% Quar 2% Trid MANNO LIMESTONE, light gray (N6), and medium gray (N6), semilithified, laminated at Section 3-110 to 126 and 140 to 150. MANNO LIMESTONE, yellowish gray (5Y 8/1) with dark greenish gray laminae. CHERT, dark reddish brown (5YR 3/3), grayish brown (10YR 5/2).

Site 288 Hole A Core 17 Cored Interval: 780.0-789.5 m

AGE	FORAMS	NANNOS	RADS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHOLOGIC DESCRIPTION
					0				
					1	0.5			Water Content 1-9 (19.13) Fragments of CHERT and CHALK, reddish brown (5YR 5/2) to dark reddish brown (5YR 3/2), thinly laminated and graded with light angular inclusions; at Section 1-120 to 127; very dark grayish brown, (10YR 3/2) at Section 1-140 to 150. CHALK, very light gray (N8); semilithified, thinly-laminated at Section 1-127 to 140.
				F	1	1.0			
				N A m	Core Catcher				

Site 288 Hole A Core 18 Cored Interval: 799.0-808.5 m

AGE	FORAMS	NANNOS	RADS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHOLOGIC DESCRIPTION
					0				
					1				FORAM-BEARING MANNO CHALK, white.
				F R t p	Core Catcher				SS CC 9% N 2% M 1% Opaq 3% F 1% Calc S. 1% Fsp
					2				CHERT, pink gray (7.5YR 6/2) with laminae of brown (7.5YR 5/2), and dark reddish brown (5YR 3/3).

Site 288 Hole A Core 19 Cored Interval: 818.0-827.5 m

AGE	FORAMS	NANNOS	RADS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHOLOGIC DESCRIPTION
					0				
					1	0.5			Water Content 1-34 (30.07) ZEOLITE RICH CLAYSTONE, dark grayish brown (10YR 4/2) to light reddish brown (5YR 6/4).
					2	1.0			SS 1-117 75% Cl Tr% Fsp Tr% Chlo 25% Z Tr% N ZEOLITE-BEARING ALTERED VOLCANIC GLASS CLAYSTONE, light yellowish brown (10YR 6/4), laminated.
				F	Core Catcher				SS 1-125 5% Cl 10% Z 1% Fsp 30% G 2% Opaq Tr% Q MANNO-LIMESTONE, pinkish white, (7.5YR 8/2), MANNO CHALK, very light gray (N8), and CHERT, dark reddish brown (2.5YR 2.5/4) to reddish brown (2.5YR 4/4), to light gray (N7).

Site 288 Hole A Core 21 Cored Interval: 865.0-865.5 m

AGE	FORAMS	NANNOS	RADS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHOLOGIC DESCRIPTION
					0				
					1	0.5			LIMESTONE, very light bluish gray (5B 8/1), light pinkish gray (5YR 7/1), lenticular, parallel laminated.
					1	1.0			MANNO LIMESTONE, bluish white (5B 9/1), with slight greenish gray siltstone laminae, micro-cross-laminae at Section 2-50, wavy bedding.
					2				SS 2-49 90% N 2% G1 2% Z Tr% G 2% Fsp 2% Py 2% M Water Content 2-78 (9.54) CaCO ₃ 2-141 (46)
					3				CHERT, dusky red at Section 2-5 cm; laminated at Section 2-65, reddish brown at Section 2-110, laminated gray (N6) to greenish gray (5GY 6/1) enclosing and capped by limestone, at Section 2-120; dark grayish brown (10R 3/2) grading to olive gray (5Y 4/3) with calcite vein, at Section 2-145.
					Core Catcher				

Site 288 Hole A Core 22 Cored Interval: 865.5-875.0 m

AGE	FORAMS	NANNOS	RADS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHOLOGIC DESCRIPTION
					0				
					1	0.5			
					1	1.0			
					2				
					Core Catcher				

Explanatory notes in Chapter 1

NOTE: In Cores 20 and 21 volcanic ashes and limestones are arranged in rhythmic sequences, as follows:
 a) Top
 b) MANNO-LIMESTONE, light gray, uniform.
 c) FORAM-LIMESTONE, grades from fine sand at base to silty carbonate, light gray (N7) with medium gray (N6) laminae of GLAUCONITIC-ALTERED VOLCANIC GLASS SILTSTONE, parallel-laminated, with lenticular, wavy and lense bedding, thin chert nodules and thin chert laminae.
 d) LIMESTONE, dusky red (2-5YR 3/2) thin laminated, contains fresh zeolite, heavy minerals and ash. Shows slight grading, fissile, sharp base.

Site 288 Hole A Core 23 Cored Interval: 875.0-884.5 m

AGE	FORMS	NANNOS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
?				0					
				1	0.5-1.0	Empty			
				2					Water Content 1-5 (11.49) LIMESTONE, bluish white, light greenish gray, laminated. Water Content 1-75 (12.31) CHERT, dark brown, capping limestone at Section 1-75, very dark brown at base of horizontal offset; gray, capping limestone at Section 1-125. LIMESTONE, very light gray with greenish gray (5G 6/1) parallel laminated, wavy laminae, laminae are dark gray; amine consists of: HEAVY RICH, MAMMO, ZEOLITE RICH, MAMMO GLASS-SHARD SILTSTONE. SS 2-1 40% G1 15% Z 2% Py 1% A. Carb R. 37% N 3% HM 1% F N9 X-ray 2-19 9% Amor 54% Calc 23% Cris 5% Trid 91% Cryst 14% Quar 2% Mont 2% Bari Water Content 2-90 (14.99) CHERT, dark grayish brown (10R 4/2) and dark reddish brown (7.5YR) capping limestone, dark reddish brown (5YR 3/4) LIMESTONE, very light gray, with pinkish gray (5YR 7/3 to 5YR 6/3) at Section 3-15 and 120 to 127, thinning laminae, with green or dark gray lamina of siltstone. N9 HEAVY MINERAL, GLAUCONITE-ZEOLITE-BEARING, MAMMO-RICH, ALTERED GLASS-SHARD SILTSTONE, dusky green (5G 3/2) lamina. SS 2-85.5 67% G1 7% Opaq 3% HM 1% F 30% N 5% Z Tr% Vol. R F Water Content 3-92 (10.30) CaCO ₃ 3-99 (74) CHERT Section 3: 30 to 35 dark reddish brown (2.5YR 3/4), banded; 45 dark gray (5YR 6/1), capped with limestone; 75 and 99 dark reddish brown bleb, on limestone; 130 reddish gray (5YR 5/1) banded, with light olive brown (2.5YR 7/2); 132 reddish gray capping limestone, and 137 light brownish gray (10YR 6/2), dusky green (5G 3/2), dark grayish brown (10YR 4/2), banded, with irregular laminae. GLAUCONITE-RAD-BEARING, FORAM-RICH MAMMO LIMESTONE, thin section at Section 3-111 to 113: 74% N, 15% F, 5% R, 3% G, 1% G1 PRISM AND FORAM-BEARING, MAMMO LIMESTONE, thin section at Section 3-113 to 116: 79% N, 10% F, 5% S, 2% Fsp, 2% Opaq, 2% G MAMMO LIMESTONE, white (10YR 8/2). SS CC1 97% N 1% Fsp 1% G1 1% S MAMMO LIMESTONE, pink (5YR 8/3). SS CC2 95% N 5% Opaq 1% HM 1% G1 CHERT, reddish brown (2.5YR 4/4).

Site 288 Hole A Core 24 Cored Interval: 884.5-894.0 m

AGE	FORMS	NANNOS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
?				0					
				1	0.5-1.0				
				2					As above-partial sequences of ashy-siltstone-limestone rhythms described in Core 21, this siltstone is capped by thin, thin-bedded, thin siltstone overlain by silty limestone with flaser, wavy and lenticular bedding, wavy bedding and altered volcanic siltstone, capped by nanno, aphanitic limestone. X-ray 1-28 16% Amor 72% Calc 2% Bari 84% Cryst 26% Quar Water Content 1-87 (11.95) SECONDARY SILICA-BEARING MAMMO LIMESTONE, grades from moderate orange pink (10R 7/4), yellowish white (10YR 8/1.5), pinkish white (7.5Y 8/2), pink (5YR 7/3), pinkish gray (7.5YR 7/2), silty to aphanitic (at Section 1-17 to 30, 47 to 59, 80). Section 1-17 to 30, 47 to 59, 80. SS 1-125 50% N 10% Sec. SiO ₂ CHERT at Section 1: 15 dark reddish brown (10YR 5/8), with yellowish brown band; 35 reddish brown (5YR 4/3) capping limestone; 45 reddish brown, at base of limestone; 108 reddish brown; and 115 dark reddish brown. FORAM-BEARING-MAMMO LIMESTONE, thin section at Section 1-26 to 29: 92% N, 5% F, 2% Calc S, 1% G FORAM-RICH BEARING MAMMO LIMESTONE, pinkish white (7.5YR 8/2). SS CC 79% N 7% F 1% Z 10% M 2% Opaq 1% Fsp

Site 288 Hole A Core 25 Cored Interval: 894.0-903.5 m

AGE	FORAMS	NANNOS	RAOS	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
				ABUND.	PRES.					
CENOMANIAN				F	C	0	0.5	Empty		Lithology same as above. LIMESTONE, pinkish to pinkish gray to light reddish brown, to light gray. Mn dendrites. CALCITE VEIN CONTAINING BLACK OPAQUE MINERAL, radiating fibers (m) in pinkish white limestone, with manganese dendrites. SS 1-80 Opaque-minerals in calcite fibers. Water Content 1-90 (13.15) X-ray 1-105 79% Calc 3% Mont 17% Amor 17% Quar 3% Barri 83% Cryst CaCO ₃ 1-107 (62) CLAYSTONE, olive yellow (5Y 6/6), lamina (nontronite?) fracture fill. SS 1-115 100% Cl Zone of manganese dendrites (pyrolusite?) at Section 1-82 to 95. CHERT Section 1: 98 reddish brown, (5YR 4/4) laminated, capped by light reddish brown limestone (5YR 6/4); and 130 yellowish red (5YR 4/6), laminated, caps pinkish white limestone. MICARR-BEARING, NANNO LIMESTONE, pinkish white (7.5YR 8/2). SS CC 7% N 7% M 1% Opaq 1% Fsp
				F	C	1	1.0		*	
				F	C	2	Core Catcher		**	

Site 288 Hole A Core 27 Cored Interval: 932.0-941.5 m

AGE	FORAMS	NANNOS	RAOS	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
				ABUND.	PRES.					
ALBAIN				F	R	0	0.5	Empty		Water Content 1-124 (10.54) SECONDARY SILICA-BEARING, FORMY-RICH NANNO LIMESTONE, pinkish white (2.5YR 8/2) to pink (5YR 7/3), laminated, identified. SS 1-140 81% N 15% F 3% Silica 1% Opaq Water Content 2-61 (8.31) CaCO ₃ 2-69 (73) X-ray 2-71 13% Amor 68% Calc 2% Barri 86% Cryst 30% Quar Limestone becomes more silicified in Section 2 particularly at 82 to 87. CHERT Section 2: 33 reddish brown (5YR 4/4), capped with limestones; 36 dark red (2.5YR 3/6); 50 yellowish red (5YR 6/6); 55 reddish brown (5YR 4/4), capping limestone; 70 yellowish red (5YR 4/6); 101 brown (7.5YR 5/4); and 122 and 134 yellowish red (5YR 4/6); containing light reddish brown (2.5YR 6/4) limestone lenses. CHERT, red (2.5YR 4/4). NANNO-LIMESTONE, white (2.5Y 8/2). SS CC 96% N 1% Z 1% Opaq
				F	R	1	1.0		*	
				F	R	2	Core Catcher		**	

Site 288 Hole A Core 26 Cored Interval: 913.5-922.5 m

AGE	FORAMS	NANNOS	RAOS	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
				ABUND.	PRES.					
EARLY CENOMANIAN				F	C	0	0.5			X-ray 1-58 2% Amor 54% Calc 10% Cris 2% Trid 76% Cryst 32% Quar 1% Plag 1% Cltn Water Content 1-119 (12.24) NANNO LIMESTONE, pinkish white grading to pinkish gray, to reddish brown, to grayish blue, parallel laminae, lenticular bedding, flaser, parallel, wavy bedding; silicified at Section 1-137, heavy fracture fill; black, Mn-filled fracture at Section 1-46, calcite vein at Section 1-128. Interbedded with CHERT at Section 1: 9 dusky red (2.5YR 3/4), capped with limestone (silicified); 84 very dusky red (2.5YR 2.5/2) capped pinkish limestone (silicified); and 105 to 115 dark reddish brown (5YR 3/4), capped with limestone (silicified). HEAVY MINERAL-MICARR-BEARING, GLASS-SHARD-RICH, NANNO LIMESTONE, very pale brown (10YR 8/3). SS CC 70% N 20% G 7% M 3% HM CHERT, reddish brown (5YR 4/3).
				F	C	1	1.0		*	
				F	C	2	Core Catcher		**	

Site 288 Hole A Core 28 Cored Interval: 951.0-961.5 m

AGE	FORAMS	NANNOS	RAOS	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
				ABUND.	PRES.					
ALBAIN				F	R	0	0.5	Empty		Water Content 1-39 (13.92) LIMESTONE, light gray, medium light gray and pinkish gray (only at Section 1-50 to 100); identified, laminated, silicified immediately below chert horizons. Black laminae at section 1-78 to 82. FELDSPAR-HEAVY MINERAL-BEARING, OPAQUE-RICH, GLASS-SHARD NANNO LIMESTONE, black, laminae. SS 1-80 45% N 15% Opaq 3% Fsp 32% G 5% HM Water Content 1-106 (6.83) CaCO ₃ 1-125 (37) X-ray 1-127 13% Amor 49% Calc 23% Cris 2% Barri 87% Cryst 21% Quar 5% Trid Interbedded with CHERT, Section 1: 18 reddish brown (2.5YR 4/4) capping silicified limestone; 32 dark red (2.5YR 3/6); 35 to 37 reddish brown (5YR 4/3), capping silicified limestone; 82 to 90 dark red (2.5YR 3/6) with black (M) bands, are one white (N9) lens; 115 reddish brown (5YR 4/3); 130 dark brown (7.5YR 2.5/2); 135 brown (7.5YR 5/2) to dark brown (7.5YR 3/2), with green flecks; and 145 dark brown.
				F	R	1	1.0		*	
				F	R	2	Core Catcher		**	

Site 288 Hole A Core 29 Cored Interval: 970.0-979.5 m

AGE	FORMS	NANNOS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHOLOGIC DESCRIPTION
ALBIAN				0		Empty		
			F R f	1	0.5			N8 LIMESTONE, very light gray, to medium dark gray, thinly laminated, lenticular bedded. CaCO ₃ 1-114 (30) X-ray 1-116 15% Amor 32% Calc 28% Cris 1% Clin 86% Cryst 38% Quar 1% Plag FELDSPAR, GLAUCONITE, SPICULE-BEARING, FORAM-RICH NANNO LIMESTONE, 50th section at Section 1-116 38% S, 3% Fsp, 2% Opaq, 1% R
			N R p	Core Catcher				N4 Interbedded with CHERT. Section 1: 47 to 50 dark grayish brown (10VR 4/2), laminated (scalloped), lenticular-bedded; and 87 to 88 dark grayish brown (10VR 4/2), scalloped. LIMESTONE, greenish gray (5GY 6/1). 55 CC 98% Carb U. 1% Opaq 1% Nod

Site 288 Hole B Core 1 Cored Interval: 147.0-150.0 m

AGE	FORMS	NANNOS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHOLOGIC DESCRIPTION
MIDDLE MIOCENE				0				
			F A e N C f	1	0.5			N9 MICARB-FORAM-BEARING, NANNO OOZE, white; stiff. 55.1-111 10% F 10% M 1% Z 79% N Pumice fragment at Section 1-111.
				2	1.0			
				Core Catcher		Unopened		Core catcher missing.

Site 288 Hole A Core 30 Cored Interval: 979.5-988.5 m

AGE	FORMS	NANNOS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHOLOGIC DESCRIPTION
APTIAN			F C p	1	0.5			N7 LIMESTONE, light gray to medium dark gray, laminated, lenticular, often siltified. Water Content 1-92 (8.20) CaCO ₃ 1-102 (28) X-ray 1-103 42% Quar 2% Plag 1% Clin 7% Amor 1% Mica 7% Cryst 1% Fsp 1% K-spor 2% Mont 58% Calc 4% K-spor 2% Mont ZEOLITE-OPARQUE-BEARING HEAVY MINERAL-GLASS SHARD RICH NANNO LIMESTONE, dark gray. 55.1-129 45% N 15% M 5% Z 25% G1 10% Opaq CHERT, Section 1: 147 to 150 dark gray, with siltified limestone cap.
				Core Catcher		Empty		N4

Site 288 Hole C Core 1 Cored Interval: 112.5-117.0 m

AGE	FORMS	NANNOS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHOLOGIC DESCRIPTION
LATE PLEISTOCENE				0				
			F A g N C p	1	0.5			N8 GLASS-SHARD-BEARING, FORAM-MICARB-RICH NANNO OOZE, light gray; soft to stiff. 55.1-33 15% M 1% Z 27% N 2% G1 1% S 15% F
				2	1.0			
				3		Unopened		N8 NANNO OOZE, light gray; soft to stiff.

DEEP SEA DRILLING PROJECT

LEG 30 SITE 289

SITE SUMMARY SHEET

POSITION: Latitude: 00°29.92'S Longitude: 158°30.69'EWater depth (from sea level): 2206 meters (Echo sounding)Bottom felt at: 2224 meters (drill pipe) Penetration: 1271 mNumber of Holes: 1 Number of Cores: 133Total length of cored section: 1271 metersTotal core recovered: 712.7 metersPercentage of core recovery: 56%

OLDEST SEDIMENT CORED:

Depth below sea floor: 1262.5 meters Nature: Limestone and altered ashAge: Aptian

BASEMENT:

Depth below sea floor: 1262.5 meters (drilled)Nature: BasaltPRINCIPAL RESULTS:

Extrusive basalt, pre-early Aptian (1271-1262 m); Early Cretaceous (Aptian) to late Eocene Radiolaria-bearing limestone, siliceous limestone nanno-foram chalk, nodular chert, and tuff (1262-969 m); late Eocene to Pleistocene nanno-foram ooze and chalk (969-0 m).

The Pleistocene to early Oligocene is continuous, and contains a diverse microflora and microfauna with good to excellent preservation. Very minor chert was detected in the lower Miocene with the major appearance in late Eocene accompanied by the loss of Radiolaria from the sediments. Less chert was observed at this site than at 288. Plateau elevation has been relatively constant above the foram solution depth, with the exception of a deeper interval in the Campanian as seen also at Site 288.

At least six substantial stratigraphic breaks are present in the section. These occur between Rupelian (lower Oligocene) and Bartonian; Lutetian (middle Eocene) and Ypresian; Ypresian and Thanetian (upper Paleocene); Thanetian and Danian (lower Paleocene); lower Danian and Maastrichtian;

LEG 30 SITE 289
SITE SUMMARY SHEET, con't.

and Aptian and Campanian. The Eocene/Oligocene break is similar to that reported in the Tasman and Coral Seas.

Site 289 Hole Core 2 Cored Interval: 9.5-19.0 m

AGE	FORMAS	NANNOS	RADS	FOSSIL	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
					ABUND.	PRES.						
N22							0					
							1	0.5		*		SG 5/1, N9, N8, 5Y 8/1, N1
							2	1.0		*		NANNO-FORAM OOZE, yellowish gray, light greenish gray, and very light gray with black spots; soft.
							3					SS 1-75 54% F 45% N Tr% R Tr% SI
							4					SS 4-75 20% Py 1% G 35% N Tr% R Tr% SI
							5					SS 5-47 55% F 45% N Tr% Fsp Tr% R Tr% SI
							6					FORAM-NANNO OOZE, very light gray; soft.
												SS CC 52% N 45% F 1% G 1% R Tr% SI

Site 289 Hole Core 1 Cored Interval: 0.0-9.5 m

AGE	FORMAS	NANNOS	RADS	FOSSIL	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
					ABUND.	PRES.						
							0					
							1	0.5		*		NANNO-FORAM OOZE, light gray; soft.
							2	1.0		*		SS 1-75 55% F 44% N Tr% Fsp Tr% R
							3					X-ray 1-73 18% Amor 99% Calc 1% Quar 82% Cryst 1% Quar CaCO ₃ 1-90 (89) Grain Size 1-100 (22.0, 34.8, 43.2)
							4			*		NANNO-FORAM OOZE, medium light gray; soft.
							5			*		SS 2-32 64% F 40% N 1% Fsp Tr% Calc S.
							6			*		SS 3-75 55% F 45% N Tr% D Tr% Fish D. Tr% SI
												NANNO-FORAM OOZE, medium-greenish gray, swirled with white, very light gray, and yellowish gray, with black spots; soft.
												SS 5-75 60% F 40% N Tr% Fsp Tr% R Tr% SI
												NANNO-FORAM OOZE, yellowish gray, light greenish gray, and very light gray, with black spots; soft.
												SS 5-75 52% F 48% N Tr% Fsp Tr% R Tr% SI

Site 289 Hole Core 5 Cored Interval: 38.0-47.5 m

AGE	FORAMS	NANNOS	RAOS	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
				ABUND.	PRES.						
N22						0					5B 8/1, 5C 8/1, 5V 6/1 + 56 6/1
				N A	g-	1	0.5		3		NANNO-FORAM OOZE, white, yellowish gray, greenish gray, black spots; soupy to soft. SS 1-120 55% F 43% N 1% Fsp 1% Py 1% G1 1% SI 1% Caic S.
						2					Pyrite abundant
				N A	g-	3			*		NANNO-FORAM OOZE, colors as above; soft. SS 3-25 55% F 41% N 2% R 2% S 2% G1 1% SI 1% Opaq 1% SI
						4					5V 7/3 (pale yellow) N9 N8 N7 5G 6/1 swirled
						5			*		NANNO-FORAM OOZE, pale yellow, very light gray, greenish gray, with black spots; soft. SS 5-62 55% F 42% N 1% Py 1% R 1% SI 1% D 1% S
						6					N9 N8
				F A R F N A	g- g- g-	Core Catcher			*		NANNO-FORAM OOZE, very light gray; soft. SS CC 50% F 46% N 2% R 1% SI 1% G1 Tr% D

Site 289 Hole Core 6 Cored Interval: 47.5-57.0 m

AGE	FORAMS	NANNOS	RAOS	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
				ABUND.	PRES.						
N21						0					
						1	0.5		3		NANNO-FORAM OOZE, white, yellowish gray, bluish white, light greenish gray; soft. SS 1-93 60% F 39% N 1% R Tr% Fsp Tr% G1 Tr% D Tr% SI CaCO ₃ 1-89 (90) Grain Size 1-93 (8.3, 27.1, 64.6)
						2					+N1 >56 8/1
						3			*		NANNO-FORAM OOZE, white, yellowish gray, bluish white, light greenish gray; soft. SS 3-25 55% N Tr% G1 Tr% R Tr% S H ₂ S abundant
						4			*		NANNO-FORAM OOZE, colors as above; soft. SS 4-75 54% F 45% N 1% R Tr% Fsp Tr% SI
						5					H ₂ S
						6					NANNO-FORAM OOZE, very light gray; soft. SS CC 57% F 40% N 2% R 1% S Tr% Fsp Tr% G1 Tr% SI
				F A R F N A	g- g- g-	Core Catcher			*		N8

AGE	FORMS	MANNOS	RAOS	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
				ABUND.	PRES.						
LATE PLEISTOCENE	N19-N21	Discoster brouweri		F A e		0					FORAM-NANNO OOZE, soft/stiff. Color as below and above.
				N A		1	0.5				N9, 5Y 8/1, SB 9/1, 56 8/1, N1
						1	1.0			3 *	NANNO-FORAM OOZE, white, yellowish gray, bluish white, light greenish gray, black spots; soft.
						2					SS 1-75 60% F 38% N 1% R 1% SI Tr% G1 Tr% Opaq Tr% S
						2					Grain Size 1-50 (7.8, 33.0, 59.2) CaCO ₃ 1-55 (91) X-ray 1-60 12% Amor 88% Cryst 100% Calc
						3					
						4					NANNO-FORAM OOZE, color as above; stiff.
						4					SS 4-75 55% F 45% N Tr% Fsp Tr% G1 Tr% R Tr% S Tr% SI
						5					
						6					NANNO-FORAM OOZE, very light gray; soft/stiff.
						6					N8 56Y 8/1 (light greenish gray)
						6					5Y 8/1
						6					H ₂ S, strong smell
						6					SS CC 50% F 47% N 1% R 1% S Tr% Esp Tr% D
						6					N8

AGE	FORMS	MANNOS	RAOS	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
				ABUND.	PRES.						
LATE PLEISTOCENE	N21	Discoster brouweri		F A e		0					FORAM-NANNO OOZE, colors as above; soft.
				N A		1	0.5				N9, 5Y 8/1, SB 9/1, 56 8/1, N1
						1	1.0			3	NANNO-FORAM OOZE, white, yellowish gray, bluish white, light greenish gray, black spots; soft.
						2					SS 1-75 60% F 37% N 1% G1 1% R Tr% Fsp Tr% HM Tr% SI
						2					
						3					
						4					NANNO-FORAM OOZE, colors as above; soft.
						4					SS 4-75 52% F 43% N 1% G1 1% R Tr% Fsp Tr% Opaq Tr% S Tr% SI
						5					
						6					NANNO-FORAM OOZE, very light gray; soft.
						6					SS CC 50% F 45% N 2% R 2% S 1% Opaq Tr% G1 Tr% SI
						6					N8

Site 289 Hole Core 10 Cored Interval: 85.5-95.0 m

AGE	FORMAS	NANNOS	RADS	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
				ABUND.	PRES.						
						0					
				F	A	1	0.5	Empty			5Y 8/1, 5GY 8/1, NI, N9, NB swirled
				F	A	1	1.0		*		MAMMO-FORAM OOZE, yellowish gray, light greenish gray, black, light gray, white; stiff. SS 1-85 54% F 46% N Tr% G1 Tr% R Tr% S1
				F	A	2			*		H ₂ S Black spot = pyrite spheres and clay-size particles. SS 2-9.5
						3					H ₂ S Calc. 3-70 (93) Grain Size 3-80 (12.2, 36.7, 61.1)
						4					H ₂ S
				N	A	5					MAMMO-FORAM OOZE, very light gray, stiff. SS CC 55% F 44% N Tr% Opaq Tr% Esp Tr% R Tr% S1
				F	A						
				R	F						
				N	A						
									*		NB

Site 289 Hole Core 9 Cored Interval: 76.0-85.5 m

AGE	FORMAS	NANNOS	RADS	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
				ABUND.	PRES.						
						0					5Y 8/1, 5GY 8/1, NI, N9 MAMMO-FORAM OOZE, stiff. H ₂ S.
						1	0.5				5Y 8/1, 5GY 8/1, NI, N9 swirled
						2	1.0		*		MAMMO-FORAM OOZE, yellowish gray, light greenish gray, black, white, stiff (minor soupy). SS 1-72 60% F 39% N 1% R Tr% Esp Tr% S Tr% S1
						3					H ₂ S
						4			*		MAMMO-FORAM OOZE, color as above, stiff. SS 4-75 58% F 38% N 1% R Tr% S Tr% Opaq Tr% G1 Tr% S1
						5					H ₂ S
				F	A						
				R	F						
				N	A						
									*		NB

LATE PLIOCENE

Discaster brouweri
Sponaster pentas

Site 289 Hole Core 13 Cored Interval: 114.0-123.5 m

AGE	FORMS	NANNOS	RADS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
EARLY PLIOCENE	N19	<i>Ceratiolithus tricorniciolatus</i>	<i>Reticulofenestra pseudumbilica</i>	F A e- N A m-	0					
		<i>C. rugosus</i> Subzone)	<i>Spongaster pentas</i>		1	0.5	Empty			
					2	1.0		3	*	FELDSPAR BEARING NANNO-FORAM OOZE, white, yellowish gray, greenish gray, with black spots; soft/stiff. SS 2-25 38% F 34% N 4% Esp 2% R Tr% G1 Tr% S N9 5Y 8/1 5GY 8/1 N1 swirled
					3					
					4					NANNO-FORAM OOZE, very light gray; soft. SS CC 55% F 38% N 2% S1 1% G1 1% D 1% S NB
					Core Catcher					

Site 289 Hole Core 14 Cored Interval: 123.5-133.0 m

AGE	FORMS	NANNOS	RADS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
EARLY PLIOCENE	N18	<i>Ceratiolithus tricorniciolatus</i> (C. rugosus Subzone)	<i>Spongaster pentas</i>	F A 9- N A m-	0					
					1	0.5				
					2	1.0		3	*	NANNO-FORAM OOZE N9 N1 5Y 8/1 5GY 8/1 Swirled H ₂ S H ₂ S - stiff
					3					
					4					H ₂ S
					5					H ₂ S
					6					NANNO-FORAM OOZE, very light gray, stiff. SS CC 55% F 42% N 2% R 1% S Tr% Esp Tr% D Tr% Opaq Tr% S1 NB
					Core Catcher					

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Site 289 Hole Core 15 Cored Interval: 133.0-142.5 m

AGE	FORMAS	NANNOS	RAOS	FOSSIL CHARACTER			SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
				FOSSIL	ABUND.	PRES.						
EARLY PIOCENE	N18	<i>Geratolithus ericoroniculatus</i> (C. acutus Subzone)	<i>Spongaster pentas</i>				0					
				F A 9-	R A 9-	N A 9-						
				Core	Core	Core						
				Catcher	Catcher	Catcher						
							4					MANNO-FORM Ooze, very light gray; soft. SS CC 40% N 35% F 2% R 1% Fsp 1% SI
							3					H ₂ S
							2					MANNO-FORM Ooze, white and yellowish gray; soft. SS 1-100 35% F 41% N 2% R 1% Fsp 1% SI Tr% D
							1					N9 5Y 8/1 swirled
							0					Empty

Site 289 Hole Core 16 Cored Interval: 142.5-152.0 m

AGE	FORMAS	NANNOS	RAOS	FOSSIL CHARACTER			SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
				FOSSIL	ABUND.	PRES.						
EARLY PIOCENE	N18	<i>Geratolithus ericoroniculatus</i> (I. rugosus Subzone)	<i>Spongaster pentas</i>				0					
				F A 9-	R A 9-	N A 9-						
				Core	Core	Core						
				Catcher	Catcher	Catcher						
							6					MANNO-FORM Ooze, very light gray; stiff. SS CC 55% F 40% N 1% R 1% SI
							5					H ₂ S
							4					H ₂ S
							3					CaCO ₃ 2-20 (95) Grain Size 2-40 (8.3, 36.6, 55.1) X-ray 2-40 10% Amor 90% Cryst 100% Calc
							2					RAD BEARING MANNO-FORM Ooze, yellowish gray, white, greenish gray, with black spots; stiff. SS 2-75 55% F 39% N 3% R 1% Fsp 1% S Tr% Py Tr% D
							1					N9 M1, 60Y 8/1 5Y 8/1 swirled
							0					MANNO-FORM Ooze

Site 289 Hole Core 18 Cored Interval: 161.5-171.0 m

AGE	FORMAS	NANNOS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
LATE MIOCENE	N17	Discaster quinqueramus (Ceratalithus primus Subzone)	F A G- R A G- N A G-	Core Catcher					
				5					RAD BEARING NANNO-FORAM OOZE, very light gray; stiff. SS CC 55% F 2% R 39% N
				4					H ₂ S
				3					H ₂ S
				2					H ₂ S RAD BEARING NANNO-FORAM OOZE, white, yellowish gray, greenish gray, with black spots; stiff. SS 2-25 60% F 3% N 1% S 1% R 1% G 1% D 1% SI CaCO ₃ 2-38 (95) Grain Size 2-40 (8.5, 35.0, 56.5)
				1	0.5-1.0	Empty	3		N9 N9, 5Y 8/1 N1 swirled H ₂ S +5GY 8/1
				0					

Site 289 Hole Core 17 Cored Interval: 152.0-161.5 m

AGE	FORMAS	NANNOS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
LATE MIOCENE	N17	Discaster quinqueramus	F A G- R A G- N A G-	Core Catcher					
	N18	(Ceratalithus primus Subzone)	F A G- R A G- N A G-	4/3		Empty			N9, with N1 - spots, soft and soupy H ₂ S
	N18	Ceratalithus tricorniculatus (T. rugosus Subzone)	F A G- R A G- N A G-	3					N9, N1 (spots) 5Y 8/1, 5GY 8/1 swirled H ₂ S
				2					NANNO-FORAM OOZE, white, yellowish gray, light greenish gray, black spots; stiff. SS 2-25 55% F 43% N 1% R 1% S 1% G 1% Py
				1	0.5-1.0		3		N9 swirled 5Y 8/1 N1 5GY 8/1
				0					

Site 289 Hole Core 21 Cored Interval: 190.0-199.5 m

AGE	FORAMS	NANNOS	RAOS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHOLOGIC DESCRIPTION
N17	Discosaster quinqueramus (C. primus Subzone)		Stichocorys peregrina	F A e R F m N A m	0		Empty		
					1	0.5			N9, N1 SY 8/1 swirled
					2	1.0			H ₂ S
					3				H ₂ S
					4				NANO-FORAM OOZE, very light gray; stiff. SS CC 55% F 48% N 44% Tr% S Tr% SI
					Core Catcher				NB

Site 289 Hole Core 22 Cored Interval: 199.5-209.0 m

AGE	FORAMS	NANNOS	RAOS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHOLOGIC DESCRIPTION
N16	Discosaster quinqueramus (C. primus Subzone)		Stichocorys peregrina	F A e R F m N A m	0		Empty		
					1	0.5			N9, N1 SY 8/1 swirled
					2	1.0			NANO-FORAM OOZE, white, yellowish gray, with black spots; stiff. SS 2-75 55% F 48% N Tr% SI Tr% G1 Tr% R Tr% S CaCO ₃ 2-122 (96) Grain Size 2-122 (9.2, 38.6, 52.2)
					3				H ₂ S
					4				H ₂ S
					Core Catcher				NANO-FORAM OOZE, very light gray; stiff. SS CC 60% F 38% N 1% FSP 1% R
					Core Catcher				NB

Site 289 Hole Core 23 Cored Interval: 209.0-218.5 m

AGE	FORAMS	NANNOS	RAOS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHOLOGIC DESCRIPTION
N16	Discosaster quinqueramus (C. primus Subzone)		Discosaster quinqueramus (C. primus Subzone)	F A e R F m N A m	0		Empty		
					1	0.5			+ disturbed NANO FORAM OOZE N9
					2	1.0			NANO-FORAM OOZE, white, with swirls of yellow gray (SY 8/1) and black (N1); stiff. H ₂ S smell in all sections. SS 1-90 50% F 49% N 1% R Tr% SI Tr% S Tr% Fsp
					3				
					4				
					5				
					6				NANO-FORAM OOZE, white. SS CC 50% F 48% N 2% R Tr% S Tr% Fsp
					Core Catcher				
					Core Catcher				N9

Site 289 Hole Core 25 Cored Interval: 228.0-237.5 m

AGE	FORMANS	NANNOS	RADS	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
				FOSSIL	ABUND.						
LATE MIOCENE						0					
	Discaster quinqueramus (C. primus Subzone)					1	0.5	Empty			
						2	1.0				
						3					
						4					
						5					
						Core Catcher					

LITHOLOGIC DESCRIPTION:
 NANNO-FORAM OOZE, mainly white, with only locally swirls of light yellow gray (5Y 8/1) and some black spots (M); stiff in Sections 1, 3, and 4, soft in Section 2. H₂S smell varies in strength, but less than former cores. Very weak in Section 4.
 SS 2-75
 50% F 1% R Tr% Fsp
 48% N 1% S Tr% GI Tr% S

LITHOLOGY:
 Yellow gray colors have disappeared in Section 5.
 NANNO-FORAM OOZE, white.
 SS CC
 60% F 1% Fsp Tr% R
 39% N Tr% GI Tr% S

Site 289 Hole Core 24 Cored Interval: 218.5-228.0 m

AGE	FORMANS	NANNOS	RADS	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
				FOSSIL	ABUND.						
LATE MIOCENE						0					
	Discaster quinqueramus (C. primus Subzone)					1	0.5	Empty			
						2	1.0				
						3					
						4					
						5					
						6					
						Core Catcher					

LITHOLOGIC DESCRIPTION:
 NANNO-FORAM OOZE, white; soft to soupy.
 NANNO-FORAM OOZE, white, with swirl of yellowish gray (5Y 8/1) and black spots (M), stiff (soft in Section 3); H₂S smell throughout, but weak in Sections 2 and 6.
 SS 2-75
 50% F 1% R Tr% Fsp
 48% N 1% S Tr% GI Tr% S
 CaCO₃ 2-23 (96)
 Grain Size 2-26 (5.5, 24.6, 69.9)

LITHOLOGY:
 PYRITE-BEARING FORAM-NANNO OOZE, black spot.
 SS 5-88 (black spot)
 50% F 3% Py 1% S
 45% F 1% R Tr% Fsp
 More white (N9) in Section 6.
 RAD BEARING NANNO-FORAM OOZE, white.
 SS CC
 60% F 3% R Tr% SI
 47% N Tr% S

Site 289 Hole Core 26 Cored Interval: 237.5-247.0 m

AGE	FORAMS	NANNOS	RAOS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
N16	Discosaster quinqueramus (Discosaster bergreni Subzone)				0					
					1	0.5		3 *		N9 Manno-Foram ooze, white.
					2	1.0				N9 Manno-Foram ooze, white with black spots (N1). Color swirls; stiff. SS 1-75 1% R 50% F 1% R 49% N 1% S
					3					Section 2: soft and stiff with semilithified lumps. Mottled (both physical and bioturbated). At 271/8 a burrow cuts lamination.
					4					Section 3: stiff, lithology stays the same. CaCO ₃ 3-56 (95) Grain Size 3-58 (7.0, 42.0, 50.9)
					5					Section 4: stiff with semilithified lumps. Manno-Foram ooze/chalk + burrow at 110
					6					Section 5: stiff and semilithified.
					Core Catcher					Section 6: same lithology. Manno-Foram ooze, white. SS, CC 1% R 50% F 1% S 44% N 1% S

Site 289 Hole Core 27 Cored Interval: 247.0-256.5 m

AGE	FORAMS	NANNOS	RAOS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
N16	Discosaster neohalitus				0					
					1	0.5		4		N9 Manno-Foram ooze, white with black spots; soupy in Section 1. Color swirls. SS 1-100 2% S 50% F 1% R 47% N 1% G(?)
					2			1/3		Section 2: stiff and semilithified.
					3			1/3		Section 3: stiff and semilithified, swirled. Manno-Foram ooze, white (N9) with black (N1) spots. SS 3-75 2% S 49% F 1% R 48% N 1% R
					4			1/3		Section 4: stiff and semilithified, color swirls. BAD AND SPONGE SPICULE BEARING Manno-Foram ooze - yellowish gray (SY 8/1) spot. SS 3-76 3% R 50% F 1% R 44% N 3% S
					5			1/3		Section 5: stiff and semilithified, color swirls.
					6			1/3		Section 6: stiff and semilithified, white (N9) swirled with yellowish gray (SY 8/1) and 36/8/1 also with black (N1) spots. Manno-Foram ooze; white. SS, CC 2% R 50% F 1% S 36% N 1% S
					Core Catcher					

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Site 289 Hole Core 29 Cored Interval: 266.0-275.5 m

AGE	FORAMS	NANNOS	RADS	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
				ABUND.	PRES.					
LATE MIOCENE	NT6					0				
						1	0.5			
						2	1.0			
						3				
						4				
						5				
						6				
						7				
						8				
						9				

Site 289 Hole Core 28 Cored Interval: 266.5-266.0 m

AGE	FORAMS	NANNOS	RADS	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
				ABUND.	PRES.					
LATE MIOCENE	NT6					0				
						1	0.5			
						2	1.0			
						3				
						4				
						5				
						6				
						7				
						8				
						9				

Site 289 Hole Core 30 Cored Interval: 275.5-285.0 m

AGE	FORMAMS	MANNOS	RADIS	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
				ABUND.	PRES.					
N16				F	A	0		Empty		
	<i>Discosaster neohamatus</i>			R	A	1	0.5			N9 (white)
	<i>Omatartus antepenultimus Zone</i>			R	A	2	1.0			N9
				R	A	3				N9
				R	A	4				N9
				R	A	5				N9
				R	A	6				N9
				R	A	7				N9
				R	A	8				N9
				R	A	9				N9
				R	A	10				N9
				R	A	11				N9
				R	A	12				N9
				R	A	13				N9
				R	A	14				N9
				R	A	15				N9
				R	A	16				N9
				R	A	17				N9
				R	A	18				N9
				R	A	19				N9
				R	A	20				N9
				R	A	21				N9
				R	A	22				N9
				R	A	23				N9
				R	A	24				N9
				R	A	25				N9
				R	A	26				N9
				R	A	27				N9
				R	A	28				N9
				R	A	29				N9
				R	A	30				N9
				R	A	31				N9
				R	A	32				N9
				R	A	33				N9
				R	A	34				N9
				R	A	35				N9
				R	A	36				N9
				R	A	37				N9
				R	A	38				N9
				R	A	39				N9
				R	A	40				N9
				R	A	41				N9
				R	A	42				N9
				R	A	43				N9
				R	A	44				N9
				R	A	45				N9
				R	A	46				N9
				R	A	47				N9
				R	A	48				N9
				R	A	49				N9
				R	A	50				N9
				R	A	51				N9
				R	A	52				N9
				R	A	53				N9
				R	A	54				N9
				R	A	55				N9
				R	A	56				N9
				R	A	57				N9
				R	A	58				N9
				R	A	59				N9
				R	A	60				N9
				R	A	61				N9
				R	A	62				N9
				R	A	63				N9
				R	A	64				N9
				R	A	65				N9
				R	A	66				N9
				R	A	67				N9
				R	A	68				N9
				R	A	69				N9
				R	A	70				N9
				R	A	71				N9
				R	A	72				N9
				R	A	73				N9
				R	A	74				N9
				R	A	75				N9
				R	A	76				N9
				R	A	77				N9
				R	A	78				N9
				R	A	79				N9
				R	A	80				N9
				R	A	81				N9
				R	A	82				N9
				R	A	83				N9
				R	A	84				N9
				R	A	85				N9
				R	A	86				N9
				R	A	87				N9
				R	A	88				N9
				R	A	89				N9
				R	A	90				N9
				R	A	91				N9
				R	A	92				N9
				R	A	93				N9
				R	A	94				N9
				R	A	95				N9
				R	A	96				N9
				R	A	97				N9
				R	A	98				N9
				R	A	99				N9
				R	A	100				N9

Site 289 Hole Core 31 Cored Interval: 285.0-294.5 m

AGE	FORMAMS	MANNOS	RADIS	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
				ABUND.	PRES.					
N16				F	A	0		Empty		
	<i>Discosaster neohamatus</i>			R	A	1	0.5			N9 with N1 spots
	<i>Omatartus antepenultimus Zone</i>			R	A	2	1.0			N9 with N1 spots SG 8/1 SRP 7/2 swirls at 1/90, 1/110 parallel laminae (of green and pale purple)
				R	A	3				
				R	A	4				
				R	A	5				
				R	A	6				
				R	A	7				
				R	A	8				
				R	A	9				
				R	A	10				
				R	A	11				
				R	A	12				
				R	A	13				
				R	A	14				
				R	A	15				
				R	A	16				
				R	A	17				
				R	A	18				
				R	A	19				
				R	A	20				
				R	A	21				
				R	A	22				
				R	A	23				
				R	A	24				
				R	A	25				
				R	A	26				
				R	A	27				
				R	A	28				
				R	A	29				
				R	A	30				
				R	A	31				
				R	A	32				
				R	A	33				
				R	A	34				
				R	A	35				
				R	A	36				
				R	A	37				
				R	A	38				
				R	A	39				
				R	A	40				
				R	A	41				
				R	A	42				
				R	A	43				
				R	A	44				
				R	A	45				
				R	A	46				
				R	A	47				
				R	A	48				
				R	A	49				
				R	A	50				
				R	A	51				
				R	A	52				
				R	A	53				
				R	A	54				
				R	A	55				
				R	A	56				
				R	A	57				
				R	A	58				
				R	A	59				
				R	A	60				
				R	A	61				
				R	A	62				
				R	A	63				
				R	A	64				
				R	A	65				
				R	A	66				
				R	A	67				
				R	A	68				
				R	A	69				
				R	A	70				

Site 289 Hole Core 33 Cored Interval: 304.0-313.5 m

AGE	FORMS	NANNOS	RAOS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
MIDDLE MIOCENE					0					
					1	0.5		0/1	75	N9, N1, 5Y 8/1, 5G 8/1, 5R 7/2
					2	1.0		0/1	*	NANNO-FORAM OOZE, white (N9), black spots (N1), yellowish gray (5Y 8/1), light greenish gray (5G 8/1), and pale purple (5R 7/2); stiff/semilithified, most of section is white, black occurs only in spots, light greenish gray and pale purple occurs as thin (1-2 mm) laminae, separated by medium thick (1-3 cm) bands of gray, yellowish gray occurs as thin, parallel laminae at 1/80, 1/70, 1/110, and 1/140.
					3			0/1		SS 1-75 (nanno-foram ooze) 60% F 2% R 37% N parallel laminae at 2/90
					4			0/1		parallel laminae at 3/130
					5			0/1		parallel laminae at 5/82-95, 5/140-150 chert granules at 5/75-77, 5/87
					6			0/1		parallel laminae at 6/85-93, 6/104-106, 6/130
										NANNO-FORAM OOZE, white. SS CC 55% F 44% N 1% S Tr% Py Tr% R

Site 289 Hole Core 32 Cored Interval: 294.5-304.0 m

AGE	FORMS	NANNOS	RAOS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
LATE MIOCENE					0					
					1	0.5		0/2	75	N9 (N1, 5G 8/1, 5Y 8/1, 5R 7/2 swirls)
					2	1.0		0/2	*	NANNO-FORAM OOZE/chalk, soft.
					3			0/2		RAD BEARING NANNO-FORAM CHALK, white with swirls of light greenish gray, yellowish gray, pale purple and black. Stiff-semilithified. Parallel laminae at: 1/104, 120; 2/24, 50, 120; 3/3-5, 36, 92, 110, 4/30, 85; and 5/28, 130-132.
					4			0/2		SS 2-75 55% F 3% R 39% N 1% Fsp 1% S 1% SI Tr% D
					5			0/2		CaCO ₃ 3-64 (93) Grain Size 3-66 (11.4, 46.5, 42.1) CHERT granule, medium gray (N6) at 3/100-102.
										RAD BEARING NANNO-FORAM OOZE, white. SS CC 59% F 37% N 4% R Tr% D Tr% S Tr% SI

Site 289 Hole Core 35 Cored Interval: 323.0-332.5 m

AGE	FORMS	MANNOS	RAOS	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
				ABUND.	PRES.						
MIDDLE MIOCENE	N14	Discosaster hamatus									
		Canartus peterssoni Zone									
				F	A						
				R	A						
				N	A						
				e-	m-						
						Core Catcher					
						4		0/1			White (N9)
						3		0/1		62*	FORAM-MANNO OOZE, white (N9) only, Section 3; no parallel laminae; stiff/semilithified. SS 3-62 53% N 1% M Tr% S 45% F 1% R
						2		0/1			FORAM-MANNO OOZE, white (N9), black spots (N1), yellowish gray (5Y 8/1), light greenish gray (5GY 8/1), pale purple (5RP 7/2). Semilithified, most of section is white, black occurs only in spots, light greenish gray and pale purple occur as thin (1-2 mm) laminae, separated by medium thick (1-3 cm) bands of white, yellowish gray occurs as mottles. parallel laminae 1/87-1/90 parallel laminae 2/105
						1		0.5			Empty
						0					

Site 289 Hole Core 34 Cored Interval: 313.5-323.0 m

AGE	FORMS	MANNOS	RAOS	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
				ABUND.	PRES.						
MIDDLE MIOCENE	N15	Discosaster hamatus									
		Canartus peterssoni Zone									
				F	A						
				R	A						
				N	A						
				e-	m-						
						Core Catcher					
						6		0/1			White (N9)
						5		0/1			white (N9), black (N1) spots scattered
						4		0/1			yellowish gray (5Y 8/1) mottles
						3		0/1			parallel laminae at 3/40-43, 3/60-62, 3/80-83, 3/101-104 CaCO ₃ 3-59 (94) Grain Size 3-60 (3.8, 57.7, 38.6)
						2		0/1			parallel laminae at 2/38-43 SS 1-75 50% F 48% N 1% M Tr% S
						1		0.5		75*	MANNO-FORAM OOZE, white (N9), black spots (N1), yellowish gray (5Y 8/1), light greenish gray (5GY 8/1), pale purple (5RP 7/2); stiff/semilithified, most of section is white, black occurs only in spots, light greenish gray and pale purple occur as thin (1-2 mm) laminae, separated by medium thick (1-3 cm) bands of white, yellowish gray occurs as mottles; parallel laminae at 1/20, 1/50, 1/63, and 1/78.
						0					

parallel laminae at 6/40-47, 6/72-77
RAD BEARING FORAM-MANNO OOZE
SS 6-75
50% N 3% R Tr% G1
47% F 1% S Tr% Py
MANNO-FORAM OOZE, white.
SS CC
50% F
48% N 2% R Tr% S
1% Fsp

Site 289 Hole Core 36 Cored Interval: 332.5-342.0 m

AGE	FORMS	NANNOS	RADS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
MIDDLE MIOCENE	N14	Discoaster hamatus		F A e-	6	0.5	0/1	75	MANNO-FORAM OOZE, white.
	N14	Discoaster hamatus		F A e-	5	1.0	0/1		MANNO-FORAM OOZE, white.
	N14	Discoaster hamatus		F A e-	4	0.5	0/1		MANNO-FORAM OOZE, white (N9), black (N1) spots, greenish gray (5G/7) and light gray (N7) parallel laminae at 6/30-34 and 6/140-142; st1rr/semi11thified.
	N15	Canarrtus petterssoni Zone		F A e-	3	1.0	0/1		MANNO-FORAM OOZE, white (N9), black (N1) spots, light gray (N8) in bands (2-4 cm thick), greenish gray (5G 6/7) and pale purple (5RP 7/2) in parallel laminae; semi-lithified/soft; light gray banding at 2/23-34.
	N15	Canarrtus petterssoni Zone		F A e-	2	0.5	0/1		MANNO-FORAM OOZE, white (N9), black (N1) spots, light gray (N8) in bands (2-4 cm thick), greenish gray (5G 6/7) and pale purple (5RP 7/2) in parallel laminae; semi-lithified/soft; light gray banding at 2/23-34.
	N15	Canarrtus petterssoni Zone		F A e-	1	0.5	0/1		MANNO-FORAM OOZE, white (N9), black (N1) spots, light gray (N8) in bands (2-4 cm thick), greenish gray (5G 6/7) and pale purple (5RP 7/2) in parallel laminae; semi-lithified/soft; light gray banding at 2/23-34.
	N15	Canarrtus petterssoni Zone		F A e-	0	0.5	0/1		MANNO-FORAM OOZE, white (N9), black (N1) spots, light gray (N8) in bands (2-4 cm thick), greenish gray (5G 6/7) and pale purple (5RP 7/2) in parallel laminae; semi-lithified/soft; light gray banding at 2/23-34.

Site 289 Hole Core 37 Cored Interval: 342.0-351.5 m

AGE	FORMS	NANNOS	RADS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
MIDDLE MIOCENE	N13	Discoaster exilis		F A e-	6	0.5	0/1	75	MANNO-FORAM OOZE, white (N9), black (N1) spots, light gray (N8) in bands (2-4 cm thick), greenish gray (5G 6/7) and pale purple (5RP 7/2) in parallel laminae; semi-lithified/soft; light gray banding at 2/23-34.
	N14	Discoaster exilis		F A e-	5	1.0	0/1		MANNO-FORAM OOZE, white (N9), black (N1) spots, light gray (N8) in bands (2-4 cm thick), greenish gray (5G 6/7) and pale purple (5RP 7/2) in parallel laminae; semi-lithified/soft; light gray banding at 2/23-34.
	N14	Discoaster exilis		F A e-	4	0.5	0/1		MANNO-FORAM OOZE, white (N9), black (N1) spots, light gray (N8) in bands (2-4 cm thick), greenish gray (5G 6/7) and pale purple (5RP 7/2) in parallel laminae; semi-lithified/soft; light gray banding at 2/23-34.
	N14	Discoaster exilis		F A e-	3	1.0	0/1		MANNO-FORAM OOZE, white (N9), black (N1) spots, light gray (N8) in bands (2-4 cm thick), greenish gray (5G 6/7) and pale purple (5RP 7/2) in parallel laminae; semi-lithified/soft; light gray banding at 2/23-34.
	N14	Discoaster exilis		F A e-	2	0.5	0/1		MANNO-FORAM OOZE, white (N9), black (N1) spots, light gray (N8) in bands (2-4 cm thick), greenish gray (5G 6/7) and pale purple (5RP 7/2) in parallel laminae; semi-lithified/soft; light gray banding at 2/23-34.
	N14	Discoaster exilis		F A e-	1	0.5	0/1		MANNO-FORAM OOZE, white (N9), black (N1) spots, light gray (N8) in bands (2-4 cm thick), greenish gray (5G 6/7) and pale purple (5RP 7/2) in parallel laminae; semi-lithified/soft; light gray banding at 2/23-34.
	N14	Discoaster exilis		F A e-	0	0.5	0/1		MANNO-FORAM OOZE, white (N9), black (N1) spots, light gray (N8) in bands (2-4 cm thick), greenish gray (5G 6/7) and pale purple (5RP 7/2) in parallel laminae; semi-lithified/soft; light gray banding at 2/23-34.

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Site 289 Hole Core 45 Cored Interval: 418.0-427.5 m

AGE	FORAMS	MANNOS	RAOS	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
				ABUND.	PREV.						
MIDDLE MIOCENE	N12					0					N9 white Manno-FORAM OOZE/CHALK
						1	0.5				N9 white, black Manno-FORAM OOZE/CHALK laminae, greenish gray RAD BEARING MANNO-RICH MANNO OOZE, white. SS 1-75 70% F 21% N 5% R 2% S 2% M 1% D
						2	1.0				Semilithified/stiff, parallel laminae at: Section 1-52 to 57, 60 to 63, 66, 96 to 97, 98 Section 2-2, 4, 5, 73 to 77, 98 to 103
						3					N9 N1 spots N1 layers semilithified
						4					semilithified/stiff N1 laminae Section 4-52 to 100
						5					N1 laminae Section 5-107 and 121 to 127
						6					SPONGE SPICULE BEARING MANNO-FORAM OOZE, white. SS CC 50% F 46% N 3% S 1% R Tr% Esp Tr% G1 Tr% Py Tr% Nod

Site 289 Hole Core 44 Cored Interval: 408.5-418.0 m

AGE	FORAMS	MANNOS	RAOS	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
				ABUND.	PREV.						
MIDDLE MIOCENE	N12					0					N9 8/1 blebs Manno-FORAM OOZE/CHALK
						1	0.5				Manno-FORAM CHALK, white, with yellowish gray blebs: semilithified/stiff. SS 1-75 60% N 2% R Tr% D Tr% S1 50% F Tr% S
						2	1.0				Parallel laminae at: Section 2-34 to 36, 48, 109 Section 3-42 to 43 Section 4-10 to 12, 18 to 20, 5RP 7/2 laminae 26 to 29, 49 to 51 N7 bands + 5Y 8/1 blebs
						3					CaCO ₃ 3-17 (91) Grain Size 3-20 (22.0, 43.6, 34.4)
						4					N9 soft
						5					semilithified at 62-68
						6					RAD BEARING MANNO-FORAM OOZE, white; semilithified/soft. SS CC 65% F 32% N 3% D Tr% S

Site 289 Hole Core 49 Cored Interval: 256.0-465.5 m

AGE	FORAMS	NANNOS	RAOS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHOLOGIC DESCRIPTION
MIDDLE MIOCENE	N9	Sphenolithus heteromorphus		F A	0				FORAM-NANNO CHALK/OOZE
	N9	Sphenolithus heteromorphus		F A	1	0.5		1/0*	N9 white N1 black spots and parallel laminae SPR 7/2 pale purple parallel laminae SG 6/1 greenish-gray parallel laminae
	N9	Sphenolithus heteromorphus		F A	2	1.0			MICARB AND RAD BEARING FORAM-NANNO CHALK, white. SS 1-75 55% F 38% N 45% F 4% M 3% R Tr% S
	N9	Sphenolithus heteromorphus		F A	3				semilithified/stiff parallel laminae at: Section 1-5, 40 to 66, 75, 95 Section 2-1, 100 to 106 Section 3-25, 35 to 41, 107 to 109
	N9	Sphenolithus heteromorphus		F A	4				Chalk semilithified parallel laminae at Section 4-4 to 6, 30 to 52, 127 to 128
	N9	Sphenolithus heteromorphus		F A	5				ooze chalk/ooze semilithified/stiff parallel laminae Section 5-77 to 79
	N9	Sphenolithus heteromorphus		F A	6			0/1	soft/semilithified
	N9	Sphenolithus heteromorphus		F A	7				NANNO-FORAM CHALK, white. SS CC 55% F 38% N 4% R 1% S Tr% D
	N9	Sphenolithus heteromorphus		F A	8				
	N9	Sphenolithus heteromorphus		F A	9				
	N9	Sphenolithus heteromorphus		F A	10				

Site 289 Hole Core 48 Cored Interval: 446.5-456.0 m

AGE	FORAMS	NANNOS	RAOS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHOLOGIC DESCRIPTION
MIDDLE MIOCENE	N9	Sphenolithus heteromorphus		F A	0				NANNO-FORAM CHALK/OOZE
	N9	Sphenolithus heteromorphus		F A	1	0.5		1/0*	N9 white SY 8/1 sparse yellowish-gray blebs SG 6/1 greenish-gray laminae at Section 1-35, 115
	N9	Sphenolithus heteromorphus		F A	2	1.0			MICARB-BEARING NANNO FORAM CHALK, white. SS 1-75 55% F 38% N 1% S 1% R
	N9	Sphenolithus heteromorphus		F A	3			2/0	semilithified/stiff parallel laminae at Section 2-100 to 102, 126
	N9	Sphenolithus heteromorphus		F A	4				N9 white N1 black spots semilithified/stiff CaCO ₃ 3-43 (95) Grain Size 3-46 (17.7, 31.3, 50.9) X-ray 3-50 7% Amor 93% Cryst 100% Calc
	N9	Sphenolithus heteromorphus		F A	5				parallel laminae at Section 4-51, 74 to 76
	N9	Sphenolithus heteromorphus		F A	6			1/0	NANNO-FORAM CHALK, white. SS CC 55% F 38% N 4% R 1% S 1% Calc S.
	N9	Sphenolithus heteromorphus		F A	7				
	N9	Sphenolithus heteromorphus		F A	8				
	N9	Sphenolithus heteromorphus		F A	9				
	N9	Sphenolithus heteromorphus		F A	10				

Site 289 Hole Core 51 Cored Interval: 475.0-484.5 m

AGE	FORAMS	NANNOS	RADS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHOLOGIC DESCRIPTION
MIDDLE MIOCENE	N9	Sphenolithus heteromorphus		F A e	0				
	N9		Boradospyrta alata Zone	F A e	1	0.5	Empty		N9, N1 spots NANNO-FORAM CHALK, white (N9); semilithified. SS 1-90 55% F 2% R 38% N 1% GI 1% S 1% D
				F A e	2	1.0		0	Black (N1) streaks, spots and parallel laminae at: Section 1-40 to 64, 98 to 101 Section 2-122 to 125, 133 to 139 Section 5-92 to 100
				F A e	3			0	
				F A e	4			0	
				F A e	5			0/1	NANNO-FORAM CHALK/OOZE, white, semilithified/stiff.
				F A e	6				N9, 50% B/I, NB White (N9) with light greenish gray (EGY B/I) and thin (N9) parallel laminae at Section 6-3 to 5, 141 to 144. RAD BEARING NANNO-FORAM CHALK, white. SS CC 55% F 40% N 3% R 1% S
				N C m	Core Catcher			*	

Site 289 Hole Core 50 Cored Interval: 465.5-475.0 m

AGE	FORAMS	NANNOS	RADS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHOLOGIC DESCRIPTION
MIDDLE MIOCENE	N9	Sphenolithus heteromorphus		F A e	0				
			Boradospyrta alata Zone	F A e	1	0.5		0/1 *	N9 white N9 light gray N1 black NANNO-FORAM CHALK/CHALK NANNO-FORAM CHALK/OOZE all in parallel laminae, semilithified 0-30
				F A e	2	1.0			N9 white MICARR. AND RAD BEARING NANNO-FORAM OOZE, white; semilithified/stiff. SS 1-75 3% M 3% R 39% N
				F A e	3				N9 black streaks, spots and laminae at: Section 2-44 to 46, 52 to 54 Section 3-90 to 92, 100 to 103, 106 to 107, 110 to 112, 120 to 125, 130 to 138
				F A e	4				N9 CaCO ₃ 3-67 (95) Grain Size 3-70 (13.8, 41.6, 44.6)
				F A e	5			0/1	
				F A e	6				N9 white N9 light gray in parallel laminae at Section 6-30 to 52, 124 to 125 N1 black spots NANNO-FORAM CHALK, white. SS CC 55% F 39% N 4% R 1% Esp 1% S
				N A m	Core Catcher			*	

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Site 289 Hole Core 53 Cored Interval: 494.0-503.5 m

AGE	FORAMS	NANNOS	RAOS	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHOLOGIC DESCRIPTION
				ABUND.	PRES.					
EARLY MIOCENE	N8	Sphenolithus heteromorphus	Calocyclus costata Zone	F	A	9				
				N	C	F	Core Catcher			
						4				
						3		Void	5	
						2				
						1	1.0			
						0	0.5	Empty		

N9 (N8, N1 laminae)
 NANO-FORAM CHALK/OOZE
 NANO-FORAM CHALK, white with black (N1) streaks and parallel laminae.
 SS 2-75 2% R Tr% Fsp
 55% F 2% R 1% SI
 42% N
 semilithified/stiff (Sections 1 and 2)
 semilithified/soft (Sections 3 and 4)
 Parallel laminae at:
 Section 1-127 to 130, 141 to 144
 Section 2-19, 48 (black)
 Section 3-117 (black)
 Section 4-55 to 60, 76 to 78,
 139 to 150 (light greenish gray)
 + small burrow? (4/60)
 PYRITE BEARING NANO-FORAM CHALK, white.
 SS CC 3% Fy 2% M Tr% S
 55% F 2% Fe-0 1% R
 37% N

Site 289 Hole Core 52 Cored Interval: 494.5-494.0 m

AGE	FORAMS	NANNOS	RAOS	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHOLOGIC DESCRIPTION
				ABUND.	PRES.					
EARLY MIOCENE	N8	Sphenolithus heteromorphus	Calocyclus costata Zone	F	A	9				
				N	C	F	Core Catcher			
						6				
						5				
						4				
						3				
						2				
						1	1.0			
						0	0.5			

N9
 N9, N1
 NANO-FORAM CHALK, white.
 NANO-FORAM CHALK/OOZE
 DIATOM AND RAD BEARING NANO-FORAM CHALK, white with black streaks and spots.
 SS 1-75 3% D 1% SI
 50% F 3% R
 43% N
 semilithified/stiff
 parallel laminae (light greenish gray) at Section 1-4 to 8
 Spots, streaks and laminae (black) at:
 Section 1-31, 96
 Section 2-47 to 150
 Section 4-27
 CaCO₃ 3-128 (95)
 Grain Size 3-131 (18.9, 46.4, 34.7)
 X-ray 3-135
 3% Anor 9% Cryst 100% Calc
 RAD BEARING NANO-FORAM CHALK, white.
 SS CC 3% R Tr% Fsp
 55% F 1% S
 41% N

Site 289 Hole Core 54 Cored Interval: 503.5-513.0 m

AGE	FORAMS	MANNS	RADS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHOLOGIC DESCRIPTION
N8					0				NANNO-FORAM CHALK/OOZE
					1	0.5	Empty		N9 (N1 spots and streaks)
					2	1.0			NANNO-FORAM CHALK, white with black spots and streaks; semilithified/soft. SS 2-75 2% R 1% Calc S. Tr% D. 55% F 1% S Tr% Esp Tr% ST 41% N
					3		Void		CaCO ₃ 3-100 (93) Parallel laminae at: Section 1-134 to 145 Section 3-107 to 112, 124 to 131 (black) Oval banding (black) at Section 3-115.
					4				RAD AND MICARB BEARING FORAM-NANNO OOZE, white. SS CC 3% M Tr% GT 66% N 3% R Tr% S 30% F
					Core Catcher				N9

Site 289 Hole Core 55 Cored Interval: 513.0-522.5 m

AGE	FORAMS	MANNS	RADS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHOLOGIC DESCRIPTION
N7					0				NANNO-FORAM CHALK/OOZE RAD BEARING NANNO-FORAM OOZE, white; semilithified/stiff. SS 1-75 3% R 1% ST 51% F 1% S 43% N 1% Calc S.
					1	0.5			
					2	1.0			
					3				greenish white in Section 4
					4				
					5				
					6				MICARB BEARING, RAD RICH FORAM-NANNO CHALK, white. SS CC 20% R 1% S 40% N 3% M 36% F
					Core Catcher				

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Site 289 Hole Core 56 Cored Interval: 522.5-532.0 m

AGE	FORMAS	NANNOS	RAIDS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHOLOGIC DESCRIPTION
EARLY MIOCENE	N7	Thelcopontosphæra amplipertura			0				
		Calocyclus virginis Zone			1	0.5	Void	5	N8 very light gray chalk ooze
					2	1.0		*	N9 white
					3				N8 N1 black spots, N1 and 56 6/1 black and greenish gray laminae. RAD AND FORAM BEARING MANNIO CHALK, white; semilithified/stiff. SS 2-75 77% N 10% F 10% R 3% M Tr% G1
					4			0/1	Grain Size 3-66 (5.7, 64.7, 29.6) CaCO ₃ 3-83 (94) Parallel laminae at: Section 2-111 to 113, 120 to 126 Section 3-3 to 7, 21 to 23 Section 4-26 to 27 (56 6/1), 69 to 72 (56 6/1)
					Core Catcher			*	N9 MICARB AND RAD BEARING MANNIO-FORAM CHALK, white. SS CC 60% F 34% N 3% M 3% R Tr% S

Site 289 Hole Core 57 Cored Interval: 532.0-541.5 m

AGE	FORMAS	NANNOS	RAIDS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHOLOGIC DESCRIPTION
EARLY MIOCENE	N7	Thelcopontosphæra amplipertura			0				
		Calocyclus virginis Zone			1	0.5		4/0	N9 chalk/ooze MICARB BEARING MANNIO-FORAM CHALK, white; semilithified/stiff. SS 1-80 20% F 3% M 3% N 2% R Tr% G1
					2	1.0		1/0	N8 chalk/ooze, very light gray, with N1 black spots N1 black parallel laminae at Section 2/22, 2/103
					3				
					4				
					5				chalk chalk, white, semilithified/stiff
					6				N9+ MICARB AND RAD BEARING MANNIO-FORAM CHALK, white. SS CC 63% F 28% N 3% M 3% R 1% S Tr% G1
					Core Catcher			*	

Site 289 Hole Core 58 Cored Interval: 547.5-551.0 m

AGE		FORAMS	NANNOS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
N6		Sphenotithus belemnos		F A 9	Core Catcher			*		N1 black spots at Section 6-22 to 30 RAD AND MICARB BEARING NANNO-FORAM CHALK, white. SS CC 60% F 34% N 3% M 3% R Tr% G1 Tr% S
EARLY MIOCENE			Calocyclus virginis Zone	F A 9	1	0.5				N9 white N9 chalk/ooze, white, black spots Section 1-7 to 14 MICARB-BEARING FORAM-NANNO CHALK, white; semilithified/stiff. SS 1-75 56% N 40% F 3% M 1% R
				F A 9	2	1.0				semilithified/soft
				F A 9	3					semilithified stiff CaCO ₃ 3-86 (94) Grain Size 3-90 (7.3, 57.0, 35.7)
					4					
					5					
					6					
N7					0					N9

Site 289 Hole Core 59 Cored Interval: 551.0-560.5 m

AGE		FORAMS	NANNOS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
N6		Sphenotithus belemnos		N A m	Core Catcher			*		N9 white N9 chalk/ooze, white, black spots Section 1-41 to 43, 71 to 72 Burrow fills at: Section 1-40, 50, 80 Section 2-80 to 85 Zoophycos at Section 2-67
EARLY MIOCENE			Calocyclus virginis Zone	N A m	2	1.0				black spots, Section 2 light gray band at Section 2-113 RAD AND MICARB BEARING NANNO-RICH FORAM CHALK, white. SS CC 70% F 23% N 3% M 3% R Tr% G1 Tr% Py
				N A m	1	0.5	Void	5		N9 white N1 black parallel laminae at Section 1-41 to 43, 71 to 72
					0					

Site 289 Hole Cored Interval: 570.0-579.5 m Core 61

AGE	FORAMS	MANNOS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
NS				0					N9 white MANNO-FORAM CHALK
				1	0.5			*	N9+ chalk/ooze, white N1 black streaks burrow at Section 1-63 MICARB AND BAD BEARING MANNO-FORAM CHALK, white; semilithified/stiff. SS 1-75 50% F 32% N 5% R 3% M Tr% S
				2					N9 chalk/ooze, white
				3				*	N8 chalk/ooze, very light gray MICARB AND BAD BEARING MANNO-FORAM CHALK, white, semilithified/stiff. SS 3-105 (green laminae) 55% F 37% N 3% R Tr% Py Tr% S
				4				0	56 6/1 greenish-gray parallel laminae at Section 3-104 to 105 N1 black laminae at Section 3-102 N1 black spots (section 3 only)
				5					N9 chalk/ooze, white parallel laminae at Section 5-117 to 119 N8 very light gray chalk/ooze
				6					N1 black spots 56 6/1 greenish-gray spots, semilithified/stiff N1 black parallel laminae at Section 6-4
				Core Catcher					N9 white MICARB-BEARING FORAM-MANNO CHALK, white. SS CC 56% N 40% F 3% M 1% R Tr% Py Tr% S

Site 289 Hole Cored Interval: 560.5-570.0 m Core 60

AGE	FORAMS	MANNOS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
NS				0					N9 white MANNO-FORAM CHALK
				1	0.5	Void	5		N8 chalk, light gray N1 black spots at Section 2-39 to 44, 95 MICARB BEARING MANNO-FORAM CHALK, white; semilithified/soft. SS 2-75 50% F 43% N 2% R Tr% Fsp X-ray 2-80 9% Amor 91% Cryst 100% Calc
				2				*	N8 chalk/ooze, light gray N1 black parallel laminae at Section 3-28 black streaks slight mottling CALC. 3-23 (95) Grain Size 3-26 (11.1, 51.5, 37.4)
				3				0	N8 chalk, light gray semilithified/stiff
				4					N8 chalk, light gray semilithified/stiff
				5					N9 chalk/ooze, white 56 6/1 greenish gray N1 black semilithified/stiff parallel laminae at Section 6-0 to 6, 34 to 37
				6			0/1		MICARB BEARING MANNO-FORAM CHALK, white. SS CC 60% F 35% N 3% M 1% R Tr% G1
				Core Catcher					N9 white

Site 289 Hole Core 62 Cored Interval: 579.5-589.0 m

AGE	FORMS	NANNOS	RAOS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
EARLY MIOCENE	NS	T. carinatus	Calocyclus virginis Zone	F A 9 N C f	0	0.5 1.0	Void			<p>NS N1 black streaks 5G 6/1</p> <p>soft semilithified/stiff</p> <p>MICARB BEARING MANNO-FORAM CHALK, white, with black streaks and greenish gray laminae, soft/semilithified.</p> <p>SS 2-75 3% M 50% F 3% R 44% N 3% S CaCO₃ 2-52 (96)</p> <p>Grain Size 2-55 (9.9, 41.2, 49.0)</p> <p>Parallel laminae at: Section 1-148 to 150 Section 2-34 to 36 (black), 117 to 136 (greenish gray)</p> <p>N9 RAD BEARING FORAM-MANNO CHALK, white; semilithified/stiff.</p> <p>SS CC 54% N 3% M Tr% G1 40% F 3% R Tr% S</p>

Site 289 Hole Core 64 Cored Interval: 598.5-608.0 m

AGE	FORMS	NANNOS	RAOS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
EARLY MIOCENE	NS	T. carinatus	Calocyclus virginis Zone	F A 9 N C f	0	0.5 1.0	Void			<p>N9, N1 (spots), 5G 6/1 (parallel laminae) slight mottling NB</p> <p>Burrows at Section 2-18; zoophycos at Section 2-99.</p> <p>RAD-RICH MANNO-FORAM CHALK, white, light gray, greenish-gray; semilithified.</p> <p>SS 2-100 15% R 1% Fsp 1% S 44% F 2% Calc S. 1% Py Tr% SI 36% N</p> <p>Intensely burrowed at Section 2-50 to 56 and 98 to 100. Parallel laminae at Section 2-139 to 143 ("pin stripe").</p> <p>Burrows at Section 3-45 and 115.</p> <p>X-ray 3-55 7% Amor 93% Cryst 100% Calc CaCO₃ 3-58 (95)</p> <p>MICARB BEARING MANNO-FORAM CHALK, white; semilithified.</p> <p>SS CC 55% F 4% M 1% R 38% N 2% Calc S. Tr% Py</p>

Site 289 Hole Core 63 Cored Interval: 589.0-598.5 m

AGE	FORMS	NANNOS	RAOS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
EARLY MIOCENE	NS	T. carinatus	Calocyclus virginis Zone	F A 9 N C f	0	0.5 1.0	Void			<p>N9 white 5G 6/1 parallel laminae</p> <p>N1</p> <p>MANNO-FORAM CHALK, white, with greenish gray and black parallel laminae; semilithified.</p> <p>SS 1-80 1% R Tr% Py 30% F 1% Fsp Tr% S 49% N</p> <p>Zoophycos at Section 1-66, and 75; mottled and burrowed at Section 1-47 to 55. burrowed at Section 2-7 to 15</p> <p>Parallel laminae at: Section 1-20 to 47 (greenish-gray), 60 to 70 (greenish-gray), 95 to 120 (greenish-gray, and black) Section 2-throughout (greenish-gray and black)</p> <p>N9 MICARB BEARING MANNO-FORAM CHALK, white; semilithified.</p> <p>SS CC 55% F 4% M 1% R 38% N 2% Calc S. Tr% S</p>

Site 289 Hole Core 65 Cored Interval: 608.0-617.5 m

AGE	FORMS	NANNOS	RAOS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
EARLY MIOCENE	NS	T. carinatus	Calocyclus virginis Zone	F A 9 N C f	0	0.5 1.0	Void			<p>N9, N8, 5G 6/1 N1</p> <p>semilithified burrowed at Section 1-128 and 142</p> <p>MANNO-FORAM CHALK, white, light gray, black spots, and greenish gray laminae; semilithified.</p> <p>SS 2-62 2% R Tr% Py 30% F 1% Fsp Tr% S 37% N 1% Calc S. Tr% S</p> <p>mottled at Section 3-10</p> <p>Parallel laminae at: Section 1-80 thru 125 Section 2-0 thru 50 Section 3-30</p> <p>burrows at Section 3-97 and 111 (zoophycos)</p> <p>MANNO-FORAM CHALK, white.</p> <p>SS CC 55% F 2% M Tr% G1 Tr% SI 42% N 1% R Tr% Py</p>

Site 289 Hole Core 69 Cored Interval: 646.0-655.5 m

AGE	FORMS	NANNOS	FOSIL RADS	FOSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHOLOGIC DESCRIPTION
EARLY MIOCENE					0				
					1	0.5	Void	5	FORAM-NANNO CHALK/OOZE N9 chalk/ooze, white 5G 8/1 light greenish gray
					2	1.0		*	MICARB-BEARING NANNO-FORAM CHALK, white; semilithified/stiff; mottling (bioturbation). SS 1-82 50% F 45% N 3% M 2% R
					3				Parallel laminae at: Section 1-31 to 33, 60 to 62, 70 to 72, 65-90, 105 to 106
					4				Parallel laminae at: Section 2-12 to 20, 100 to 106, 70 to 130 to 150 (sparse) Section 3-15, 80 to 84, 108, 136
					5				semilithified/stiff N9 chalk/ooze, white N1 black spots
LATE Oligocene	P22 T. carinatus			F A 0	Core Catcher			*	NANNO-FORAM CHALK, white; semilithified. SS CC 60% F 38% N 2% R Tr% Esp Tr% S Tr% SI

Site 289 Hole Core 68 Cored Interval: 636.5-646.0 m

AGE	FORMS	NANNOS	FOSIL RADS	FOSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHOLOGIC DESCRIPTION
EARLY MIOCENE					0				
					1	0.5	Void	3	N9 +N1 black spots
					2	1.0		*	NANNO-FORAM CHALK, white, with black spots; semilithified/stiff. SS 2-25 50% F 43% N 2% R Tr% S Tr% Calc S. Mottling at Section 2-76 to 82.
					3				CalcO. 3-62 (96) Grain Size 3-65 (10.7, 43.7, 45.6)
					4				Parallel laminae at: Section 2-27 48 86 92 97 Section 6-101
					5				Mottling at Section 6-102 to 110.
					6			*	N9 5G 6/1 N1 black spots
N4	T. carinatus			F A P N C f	Core Catcher			*	NANNO-FORAM CHALK, white; semilithified/stiff. SS CC 55% F 43% N 1% Esp 1% R Tr% S

Site 289 Hole Core 72 Cored Interval: 674.5-684.0 m

AGE	FORAMS	NANNOS	RAOS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
P22	<i>T. carinatus</i>			F A f	0					
				F A f	1	0.5	Void	5		FORAM MANNO CHALK/OOZE
				F A f	2	1.0		0		N9+ chalk/ooze, white semi lithified/soft
				F A f	3			4		N9 chalk/ooze, white RAD AND MICARB BEARING FORAM-MANNO CHALK, white; semi lithified/stiff. SS 2-75 47% N 5% M 3% R 45% F CaCO ₃ 3-71 (93) Grain Size 3-75 (7.9, 48.5, 43.6) X-ray 3-80 Tr% Moor 89% Cryst 100% Calc
				F A f	4			0		
				F A f	5					
				F A f	6					MICARB, CALCAREOUS SPICULE AND RAD BEARING MANNO-FORAM CHALK. SS CC 55% F 5% R 3% Calc S. 34% N 3% M Tr% Fish D.
				F A f	Core Catcher					

Site 289 Hole Core 73 Cored Interval: 684.0-693.5 m

AGE	FORAMS	NANNOS	RAOS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
LATE OLIIGOCENE				F A f	0					
				F A f	1	0.5	Void	5		MANNO-FORAM CHALK/OOZE
				F A f	2	1.0		0		N9 chalk, white N8 very light gray 5Y 8/1 yellowish-gray mottles/bioturbation Flaser bedding at Section 1-73 to 76. parallel laminae semi lithified/stiff Lenticular(?) and flaser bedding with mottles at Section 2-25 to 33. MICARB AND CALCAREOUS SPICULE BEARING MANNO-FORAM Ooze, white; semi lithified/stiff. SS 2-75 50% F 11% R 3% M 37% N 8% Calc S. 1% S
				F A f	3			0		N9 chalk/ooze, white semi lithified/stiff
				F A f	4					
				F A f	5					N9 chalk, white 56 6/1 greenish-gray semi lithified/hitchified parallel laminae at Section 5-120 to 130. MICARB, RAD AND CALCAREOUS SPICULE BEARING MANNO-FORAM CHALK, white. SS CC 10% Calc S. 3% M 55% F 27% N 5% R
				F A f	Core Catcher					

Site 289 Hole Core 84 Cored Interval: 788.5-798.0 m

AGE	P21	LATE Oligocene	FORAMS	NANNOS	RAOS	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
						ABUND.	PRES.						
								0		Empty			
								1	0.5-1.0				FORAM-NANNO CHALK N9 chalk, white with N7/N8 light gray
								2					MICARB AND RAD BEARING FORAM NANNO CHALK, white; semilithified, bioturbated throughout. SS 1-110 46% N 5% R 1% S 45% F 3% M X-ray 2-20 14% Amor 86% Cryst 100% Calc CaCO ₃ 2-23 (93) Parallel laminae at Section 2-50 to 57, 82 to 86. Flaser bedding at Section 2-110 to 113. Lenticular bedding at Section 2-110 to 113. Wavy bedding at Section 2-110 to 113. N9 NANNO-FORAM CHALK, white. SS CC 1% Esp 1% S 55% F 1% Py Tr% R 42% N

Site 289 Hole Core 86 Cored Interval: 807.5-817.0 m

AGE	P21	LATE Oligocene	FORAMS	NANNOS	RAOS	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
						ABUND.	PRES.						
								0		Empty			
								1	0.5-1.0				NANNO-FORAM CHALK/OOZE N9 ooze/chalk, soft, white
								2					N9 chalk/ooze, white and N8 light gray and N5 medium gray bioturbate RAD AND MICARB BEARING NANNO-FORAM CHALK, white; semilithified/stiff. SS 2-75 40% M 4% R 1% S 42% N 3% R Semilithified/stiff. Bioturbate at Section 2-24 to 31, 64 to 69. Parallel laminae at Section 2-2 to 10. CaCO ₃ 3-67 (96)
								3					N9+ chalk/ooze, white Grain Size 3-70 (4.2, 47.3, 48.6)
								4					N5 medium gray bioturbation mottling at: Section 4-52 to 54, 89 to 91 Section 5-110
								5					
								6					N9 chalk/ooze, white semilithified/stiff MICARB BEARING NANNO-FORAM CHALK. SS CC 10% M 51% F 2% R 43% N 2% R

Site 289 Hole Core 85 Cored Interval: 798.0-807.5 m

AGE	P21	LATE Oligocene	FORAMS	NANNOS	RAOS	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
						ABUND.	PRES.						
								0					
								1	0.5-1.0				NANNO-FORAM CHALK N9 chalk, white with N7/N8 light gray
								2					MICARB AND RAD BEARING NANNO-FORAM CHALK, white; semilithified. SS 1-75 60% F 5% M Tr% Py 30% N 5% R Parallel laminae at Section 1-16 to 30, 116, rest is bioturbated with intense mottling at Section 1-90 to 100. N9 NANNO-FORAM CHALK, white. SS CC 2% R Tr% Py 51% F 1% S 46% N

Site 289 Hole Core 89 Cored Interval: 836.0-845.5 m

AGE	FORAMS	MANNOS	RAOS	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHOLOGIC DESCRIPTION
				ABUND.	PREV.					
P21	Sphenolithus distentus			F	A	0				
LATE OLILOCENE		D. atechus Zone		N	C	1	0.5		3/4	FORAM-MANNO CHALK N9 chalk/ooze, white Parallel laminae at Section 1-61 to 63.
				F	A	2	1.0		*	MICARB BEARING FORAM-MANNO CHALK, white; semilitthified/stiff/soft. SS 2-76 50% F 43% N 4% M 1% S Tr% Esp Tr% R
				F	A	3			4/0.3	(core shattered after sampling with punch corer)
				F	A	4			3/4	MICARB BEARING MANNO-FORAM CHALK, white.
				F	A	Core Catcher			*	N9 white SS CC 50% F 43% N 5% M 2% R Tr% S

Site 289 Hole Core 87 Cored Interval: 817.0-826.5 m

AGE	FORAMS	MANNOS	RAOS	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHOLOGIC DESCRIPTION
				ABUND.	PREV.					
P21	Sphenolithus distentus			F	C	0				
LATE OLILOCENE		D. atechus Zone		N	C	1	0.5	Empty		N9 white chalk Flaser and 56 6/7 greenish-gray, lenticular bedding at Section 2-28 to 33, wavy bedding at Section 2-28 to 33. 56 6/7 MICARB BEARING MANNO-FORAM CHALK, white; lithified/semilitthified. SS 2-75 50% F 43% N 5% M 2% R Tr% S
				F	C	2	1.0		*	N9 white MICARB BEARING MANNO-FORAM CHALK, white. SS CC 60% F 33% N 5% M 2% R Tr% Py
				F	C	Core Catcher			*	

Site 289 Hole Core 88 Cored Interval: 826.5-836.0 m

AGE	FORAMS	MANNOS	RAOS	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHOLOGIC DESCRIPTION
				ABUND.	PREV.					
P21	Sphenolithus distentus			F	C	0				
LATE OLILOCENE		D. atechus Zone		N	C	1	0.5	Empty		N9 chalk, white with N7 light gray MICARB BEARING MANNO-FORAM CHALK, white; semilitthified, bioturbated. X-ray 2-40 7% Amor 94% Cryst. 100% Calc RAD AND MICARB BEARING MANNO-FORAM CHALK, white; semilitthified, bioturbated. SS 2-75 50% F 41% N 5% M 3% R 1% S Tr% Py
				F	C	2	1.0		*	N6 medium light gray in lenticular and flaser bedded zones at Section 2-45 to 50, bioturbation at Section 2-29 to 41, 66 to 71. Bioturbated and parallel laminae throughout Section 3. 2 mm (N6) medium gray chert fragments at Section 3-46. CaCO ₃ 3-38 (96) CaCO ₃ 3-63 (96)
				F	C	3				MICARB AND RAD BEARING MANNO-FORAM CHALK, white. SS CC 55% F 37% N 5% M 3% R Tr% Py Tr% S
				F	C	Core Catcher				

Site 289 Hole Core 90 Cored Interval: 845.5-855.0 m

AGE		FORMS	NANNOS	RADS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHOLOGIC DESCRIPTION
P21		Sphenolithus distentus								<p>N9 white</p> <p>MANNO-CHALK/DOZE MICARB AND FORAM BEARING, BAD RICH NANNO white</p> <p>SS 1-100 68% N 10% F 2% S 15% R 5% M 1% Py</p> <p>N5 medium gray Parallel laminae at: Section 1-107 to 111, 145 Section 2-throughout Section 3-50 to 52, 59 to 61 Wavy-flaser Section 4-36, 135 to 137 Section 5-26 to 31, 135 to 140 Bioturbated at: Section 1-126 to 138, 146 to 154 Section 2-throughout Section 3-32 to 48, 120 to 136, 134 to 150</p> <p>CaCO₃ 3-60 (90) Grain Size 3-64 (4.8, 44.7, 50.6)</p> <p>MANNO-FORAM CHALK, white. SS CC 52% F 2% R 46% N 1% S</p>
LATE OLILOCENE						0	0.5	Empty		
						1	1.0			
						2				
						3				
						Core Catcher				

Site 289 Hole Core 91 Cored Interval: 855.0-864.5 m

AGE		FORMS	NANNOS	RADS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHOLOGIC DESCRIPTION
P21		Sphenolithus distentus								<p>N9 white</p> <p>MANNO-FORAM CHALK/DOZE, white, semi- lithified/stiff/soft.</p> <p>(core shattered by punch corer)</p> <p>RAD BEARING MANNO-FORAM CHALK, white. SS CC 60% F 36% N 3% R 1% S 1% Esp 1% G1</p>
LATE OLILOCENE						0	0.5	Empty		
						1	1.0			
						2				
						3				
						4				
						5				
						Core Catcher				

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Site 289 Hole Core 94 Cored Interval: 883.5-893.0 m

AGE	FORMS	NANNOS	RADS	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
				ABUND.	PRES.						
LATE OLIгоценE	P20	Sphenolithus distentus	Theocyrtis tuberosa Zone	F	C	1	0.5	Empty			Parallel laminae at: Section 1-128 to 132 Section 2-20 to 29, 34, 44, 54, 63, 70, 82, 121
				F	C	2	1.0	0/4 *			CHALK/OOZE
				F	C	3					N9 N6 5% G/1 in parallel laminae at Section 1-128 to 132 Bioturbation at Section 1-136 to 140; semilithified/stiff. RAD BEARING FORAM-MANNO CHALK, white, with black and greenish gray laminae; semilithified/stiff. SS 2-77 50% N 46% F 3% R 1% G1 Tr* Py Bioturbated at Section 2-126 to 133. CaCO ₃ 3-70 (96) X-ray 3.80 (dark gray) 30% Amorph 93% Calc 70% Cryst 6% Plag Lenticular bedding at Section 3-58 to 62. Flaser bedding at Section 3-80 to 82.
				F	C	4					N9 N7 bioturbated N6 in parallel laminae Bioturbation at Section 4-20 to 30, 40 to 50, 80 to 85, 120 to 125, 145 to 150. MICARB-BEARING MANNO-FORAM CHALK, white; semilithified. SS CC 60% F 35% N 3% M 1% S
				F	C	Core Catcher				*	

Site 289 Hole Core 92 Cored Interval: 864.5-874.0 m

AGE	FORMS	NANNOS	RADS	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
				ABUND.	PRES.						
LATE OLIгоценE	P21	Sphenolithus distentus	Theocyrtis tuberosa Zone	F	C	1	0.5	Empty			N9 N6 medium gray Parallel laminae at Section 1-49 to 52, 58 to 60 NANO-FORAM CHALK/OOZE, white, semilithified/ stiff.
				F	C	Core Catcher					N9 white PYRITE AND RAD BEARING MANNO-FORAM CHALK, white. SS CC 55% F 37% N 4% R 3% Py 1% S

Site 289 Hole Core 93 Cored Interval: 874.0-883.5 m

AGE	FORMS	NANNOS	RADS	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
				ABUND.	PRES.						
LATE OLIгоценE	P21	Sphenolithus distentus	Theocyrtis tuberosa Zone	F	C	1	0.5	Empty			N9 NANO-FORAM CHALK/OOZE, white; semilithified/ stiff/soft.
				F	C	2					
				F	C	3					
				F	C	4					(core shattered by punch corer) RAD BEARING MANNO-FORAM OOZE, white. SS CC 55% F 40% N 3% R 2% S Tr* FSP Tr* Py
				F	C	Core Catcher				*	

Site 289 Hole Core 95 Cored Interval: 893.0-902.5 m

AGE		FORAMS		NANNOS		RADS		FOSSIL CHARACTER		SECTION		METERS		LITHOLOGY		DEFORMATION		LITHO. SAMPLE		LITHOLOGIC DESCRIPTION	
P20	FORAMS	NANNOS	RADS	FOSSIL	ABUND.	PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION									
LATE OLILOCENE	Sphenolithus distentus	Theocyrtis tuberosa Zone	F C F	N C F			0	0.5	Empty			Section 2 bioturbation throughout.									
							1	1.0				N9, N4, N2, N8, N5 in bioturbation at Section 1-145 to 150 Flaser(?) bedding at Section 2-21 to 36									
							2			0/4		RAD BEARING NANNO-FORAM CHALK, white, with gray laminae and bioturbated zones; semilithified/stiff.									
												SS 2-75 3% R Tr% Fsp Tr% S 53% F 42% N 2% M Tr% Py									
												MICARB BEARING NANNO-FORAM CHALK, white, semilithified/stiff.									
												SS CC 3% M 1% S 50% F 44% N 2% R									

Site 289 Hole Core 97 Cored Interval: 912.0-921.5 m

AGE		FORAMS		NANNOS		RADS		FOSSIL CHARACTER		SECTION		METERS		LITHOLOGY		DEFORMATION		LITHO. SAMPLE		LITHOLOGIC DESCRIPTION	
P20	FORAMS	NANNOS	RADS	FOSSIL	ABUND.	PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION									
LATE OLILOCENE	Sphenolithus distentus	Theocyrtis tuberosa Zone	F C P				0					NANNO-FORAM CHALK									
							1	0.5	Empty			Bioturbated throughout.									
										0/4		RAD BEARING NANNO-FORAM CHALK, white, with medium to very light gray; semilithified; bioturbated.									
												SS 1-101 3% R Tr% Fsp Tr% S 48% F 47% N 2% M									
							2		Void			N9, N8 bioturbated									
										0/4		N1 black area with rings around black spot									
												X-ray 3-77 (greenish gray) 36% Amor 96% Calc 1% Mont 64% Cryst 3% Plag									
							3		Void			N9 (5G 6/1 band at Section 3-74)									
										0/4		N8									
							4					Bioturbated throughout.									
												4M flaser(?) beds									

Site 289 Hole Core 96 Cored Interval: 902.5-912.0 m

AGE		FORAMS		NANNOS		RADS		FOSSIL CHARACTER		SECTION		METERS		LITHOLOGY		DEFORMATION		LITHO. SAMPLE		LITHOLOGIC DESCRIPTION	
P20	FORAMS	NANNOS	RADS	FOSSIL	ABUND.	PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION									
LATE OLILOCENE	Sphenolithus distentus	Theocyrtis tuberosa Zone	F R P	N C P			0					FORAM-NANNO CHALK, very light gray.									
							1	0.5	Empty			CaCO ₃ 1-101 (93)									
										0		Bioturbated with flaser(?) bedding; semilithified.									
												MICARB AND RAD BEARING NANNO-FORAM CHALK, white; semilithified.									
												SS CC 5% R 5% F 4% M 68% N 26% N									

Site 289 Hole Core 100 Cored Interval: 940.5-950.0 m

AGE	FORMAS	MANNOS	NANNOS	RADS	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE	LITHOLOGIC DESCRIPTION
					ABUND.	PRES.						
P20					F	A f	0			3		N9 N8/MS NANO-FORAM CHALK/DOZE, white chalk/ooze, very light gray to medium gray; semi-lithified/stiff, abundant bioturbation. VOLCANIC GLASS BEARING, MICARB FORAM AND RAD RICH NANO CHALK, from gray laminae.
							0.5			0		
P19					R	A g	1			4		N9 white MICARB AND RAD BEARING NANO-FORAM CHALK, white.
					N	C f	1.0			0		
					R	A g	Core					SS CC 50% F 50% C 30% N
					N	C f	Catcher					
												5% M 5% R 1% S 1% G1 1% Py

Site 289 Hole Core 102 Cored Interval: 959.5-969.0 m

AGE	FORMAS	MANNOS	NANNOS	RADS	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE	LITHOLOGIC DESCRIPTION
					ABUND.	PRES.						
P16					R	A g	0					N9 N8 NANO-FORAM CHALK, white and very light gray. RAD BEARING MICARB RICH NANO-FORAM CHALK, white and very light gray, bioturbated.
					F	R f	0.5			0 *		
					R	A g	1					SS CC 50% F 27% N CaCO ₃ 1-93 (93) X-ray 1-93 70% Amor 90% Cryst 100% Calc N6 medium light gray bands at Section 1-116 to 120, 136.
					N	C f	Core					
					R	A g	Core					N9 white MICARB AND RAD BEARING NANO-FORAM CHALK, white.
					N	C f	Catcher					
												5% M 5% R 1% S

Site 289 Hole Core 101 Cored Interval: 950.0-959.5 m

AGE	FORMAS	MANNOS	NANNOS	RADS	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE	LITHOLOGIC DESCRIPTION
					ABUND.	PRES.						
P19					R	A g	0			3		N9 N8 NANO-FORAM CHALK/DOZE, white and very light gray. RAD BEARING MICARB RICH NANO-FORAM CHALK, white and very light gray; semi-lithified/stiff/soft; bioturbated.
					F	R f	0.5			0		
					R	A g	1			3		SS 1-87 37% N 15% M 8% R 1% Py X-ray 1-83 (dark gray ash) 34% Amor 66% Cryst 100% Calc N6 medium gray bands at Section 1-83 to 84, and Section 2-25 to 32.
					N	C f	1.0			0		
					R	A g	2			4/0		RAD AND MICARB BEARING, NANO-FORAM CHALK, white to very light gray.
					N	C f	Core			4/0		
							Catcher					5% M 4% R 1% S

Site 289 Hole Core 103 Cored Interval: 969.0-978.5 m

AGE	FORMAS	MANNOS	NANNOS	RADS	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE	LITHOLOGIC DESCRIPTION
					ABUND.	PRES.						
					N	C f	0					N9 FORAM RAD CHALK NANO AND MICARB RICH FORAM RAD CHALK, white; semi-lithified; bioturbated.
					R	A g	0.5					
					R	A g	1					SS 1-80 40% R 30% F 13% N N7 light gray laminae at Section 1-107, 123.
					N	C f	1.0					
					R	A g	Core					N9 white MICARB BEARING, RAD RICH, NANO-FORAM CHALK, white.
					N	C f	Catcher					
												11% R 4% F 38% N 6% M

Site 289 Hole Core 104 Cored Interval: 978.5-985.0 m

AGE	FORMAS	MANNOS	NANNOS	RADS	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE	LITHOLOGIC DESCRIPTION
					ABUND.	PRES.						
P15					R	A g	0					N9 FORAM CHALK, white; semi-lithified/ lithified.
					F	R f	0.5					
					R	A g	1					N9 white NANO RAD FORAM CHALK, white.
					N	C f	1.0					
					R	A g	Core					SS CC 40% F 27% N 30% R
					N	C f	Catcher					
												27% N 31% M

Site 289 Hole Core 109 Cored Interval: 1026.0-1035.5 m

AGE	FORAMS	NANNOS	RADS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHOLOGIC DESCRIPTION
MIDDLE EOCENE	P12-p14	Reticulofenestra umbillica	?	R	0	0	Empty		
					1	0.5	Empty		
					1	1.0	Empty		
					Core Catcher				
									N9, N3 FORAM NANNO LIMESTONE, white limestone, dark gray chert. CHERT at Section 1-145, 147 Lithified. RAD BEARING MICARB RICH FORAM-NANNO LIMESTONE, white. SS CC 15% M 52% N 30% F(?) 3% R

Site 289 Hole Core 110 Cored Interval: 1035.5-1045.0 m

AGE	FORAMS	NANNOS	RADS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHOLOGIC DESCRIPTION
MIDDLE EOCENE	P12-p14	Reticulofenestra umbillica	Podocorythis mitra zone	R t p	0	0	Empty		
					1	0.5	Empty		
					1	1.0	Empty		
					Core Catcher				
									N9, N7, N5 RAD RICH NANNO LIMESTONE, white; lithified, partly siliceous. N6 lenticular bedding at Section 1-115, parallel laminae at Section 1-116. X-ray 1-128 23% Amor 71% Calc 16% Cris 1% Bar1 7% Cryst 5% Quar 6% Trid CaCO ₃ 1-134 (51) SILICEOUS LIMESTONE, light gray (N7), lenticular bedded at Section 1-137. CHERT, medium gray, nodular. Chert at Section 1-92 to 104, 108, 111 to 113. N9 MICARB FORAM AND RAD RICH NANNO LIMESTONE, white. SS CC 45% N 20% R(?) 20% F(?) 15% M Tr% Py

Site 289 Hole Core 111 Cored Interval: 1045.5-1054.0 m

AGE	FORAMS	NANNOS	RADS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHOLOGIC DESCRIPTION
MIDDLE EOCENE	P12-p14	Reticulofenestra umbillica	No Radiolaria zones recognizable in this or lower cores. Radiolaria absent.	F R p K f p	0	0	Empty		
					1	0.5	Empty		
					1	1.0	Empty		
					2		Void		
					2		Void		
					3		Void		
					Core Catcher				
									N9, N3, N5 NANNO LIMESTONE, white (N9); lithified; bioturbated, flaser bedding. CHERT, dark gray (N3) at: Section 1-62 to 65, 143 to 144, 149 to 150 Section 2-88 to 90 Section 3-18 to 19, 27 to 29, 70 to 71, 79 to 80, 86 to 87, 105 to 107, 112 to 113, 120 to 121, 140 to 144 Stylolites (N5) at: 2-72, 136 to 137 Section 3-42 to 44, 46

Site 289 Hole Core 112 Cored Interval: 1054.5-1064.0 m

AGE	FORAMS	NANNOS	RADS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHOLOGIC DESCRIPTION
MIDDLE EOCENE	P12 or P13	Reticulofenestra umbillica	(T. bromia Zone) downhole contamination	R A B F R p N F p	0	0	Empty		
					Core Catcher				
									N5 N9 CHERT, medium gray (N5), fragmented by drilling. LIMESTONE, white (N9). SS CC 70% N 20% M 10% F Tr% R

Site 289 Hole Core 119 Cored Interval: 1121.0-1130.5 m

AGE	FORAMS	NANNOS	RADS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
LATE PALEOCENE	P4	Discaster mohlert		F C P N C P	0	Core Catcher			*	N9 MICARB-RICH, FORAM-NANNO LIMESTONE, white (N9). 55 CC 15% M 43% N 2% Fsp 40% F

Site 289 Hole Core 122 Cored Interval: 1145.5-1155.0 m

AGE	FORAMS	NANNOS	RADS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
LATE MAASTRICHTIAN	P16	C. tenuis		N R P F R P	0	Empty				N9 N7 N4 LIMESTONE, very light gray, light gray, also medium dark gray specks, wavy, flaser and lenticular bedding at Section 1-128 to 134, and Section 2-30 to 35. (NB - Flaser and lenticular bedding best displayed where limestone and zeolite are interbedded). Styolites at Section 2-63. Bioturbated, with greenish gray (56 6/1) burrow walls. Zoophycos at Section 2-110. LIMESTONE, SILICEOUS, light olive gray (5Y 6/1) at Section 2-23 to 25. Bioturbated at Section 2-30 to 32. CHERT, red (10R 4/6). ZEOLITITE, olive gray (5Y 2/1) at Section 2-59 and 128.
LATE MAASTRICHTIAN		Plithraiphidites quadratus		F C P N R P	1	0.5-1.0				

Site 289 Hole Core 120 Cored Interval: 1130.5-1136.0 m

AGE	FORAMS	NANNOS	RADS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
LATE PALEOCENE	P4	Discaster mohlert		N C F F R P	0	Core Catcher				N9 N4 N3 N2 N1 10R 6/6 LIMESTONE, white (N9), bioturbated. CHERT, medium dark gray, medium light gray, dark gray, nodular with limestone bleds.
LATE PALEOCENE				N C F F R P	1	0.5-1.0				

Site 289 Hole Core 123 Cored Interval: 1155.0-1164.5 m

AGE	FORAMS	NANNOS	RADS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
M. MAASTRICHTIAN	G. ganssleri Zone	Plithraiphidites quadratus		F C F N C F	0	Empty				N9 LIMESTONE, white; bioturbated; styolites at Section 1-29 to 101. CHERT, red (10R 4/6) at Section 1-55 to 60.
M. MAASTRICHTIAN				F C F N C F	1	0.5-1.0				

Site 289 Hole Core 121 Cored Interval: 1136.0-1145.5 m

AGE	FORAMS	NANNOS	RADS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
EARLY PALEOCENE	F16	Cruciplacolithus tenuis		N C F F C P	0	Empty				N9 N7 Styolites at Section 1-113. Bioturbated.
EARLY PALEOCENE				N C F F C P	1	0.5-1.0				LIMESTONE, white, light gray, wavy, flaser and lenticular bedding at Section 2-78 to 93, 101 to 125, 130 to 138. CHERT, dark brown (7.5YR 3/2) at Section 2-92, 98, 126. PYRITE-BEARING, NANNO-RICH, MICARB-ZEOLITE, olive gray (5Y 4/7); occur in thin laminae at Section 2-84 and 133. 55 2-84 27% M Trx G1 50% Z 3% Py 20% N X-ray 2-84 (Zeolite) 48% Amor 1% Quar 4% Mont 52% Cryst 2% K-Spar 15% Clin 56% Calc 2% Chlo 21% Sepi
EARLY PALEOCENE				N C F F C P	2	0.5-1.0				

Site 289 Hole Core 124 Cored Interval: 1164.5-1174.0 m

AGE	FORAMS	NANNOS	RADS	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
MID. MAASTRICHTIAN	Globotruncana ganssleri Zone	Plithraiphidites quadratus		F A P N C F	0	Empty				N9 LIMESTONE, SILICEOUS, white; bioturbated; styolites at Section 2-67. CaCO ₃ 2-149 (99)
MID. MAASTRICHTIAN				F A P N C F	1	0.5-1.0				
MID. MAASTRICHTIAN				F A P N C F	2	0.5-1.0				

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Site 289 Hole Core 125 Cored Interval: 1174.0-1183.5 m

AGE	FORAMS	NANNOS	RAOS	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
				ABUND.	PRES.						
MIDDLE MASTRICHITIAN	G. ganssleri Zone			F	A	f	0.5-1.0	Empty			LIMESTONE, SILICEOUS; white, bioturbated. CHERT, red (10R 4/6) at Section 1-146 to 150.
						0					

Site 289 Hole Core 126 Cored Interval: 1183.5-1193.0 m

AGE	FORAMS	NANNOS	RAOS	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
				ABUND.	PRES.						
MIDDLE MASTRICHITIAN	G. ganssleri Zone			F	C	f	0.5-1.0	Empty			LIMESTONE, white. MICARB BEARING NANO OOZE, white; a soft to stiff interval. SS 1-140 88% N 2% F 10% M 1% Py
						0					

Site 289 Hole Core 127 Cored Interval: 1193.0-1202.5 m

AGE	FORAMS	NANNOS	RAOS	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
				ABUND.	PRES.						
EARLY MASTRICHITIAN	Tetra1ithus trifidus			F	R	p	0.5-1.0	Empty			LIMESTONE (Chalky); white and pink gray (5YR 8/1), bioturbated. X-ray 1-144 to 146 2% Amor 98% Cryst 100% Calc
						0					

Site 289 Hole Core 128 Cored Interval: 1202.5-1212.0 m

AGE	FORAMS	NANNOS	RAOS	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
				ABUND.	PRES.						
EARLY MASTRICHITIAN	Tetra1ithus trifidus			F			0.5-1.0	Empty			LIMESTONE (Chalky) white and pink gray (5YR 8/1); bioturbated.
						0					

Site 289 Hole Core 129 Cored Interval: 1212.0-1221.5 m

AGE	FORAMS	NANNOS	RAOS	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
				ABUND.	PRES.						
PLATE CAMPANIAN OR EARLY MASTRICHITIAN?	Tetra1ithus trifidus			F	N	C	0.5-1.0	Empty			LIMESTONE; white; bioturbated. CHERT, red (10R 4/6) at Section 1-140. LIMESTONE, white.
						0					

Site 289 Hole Core 130 Cored Interval: 1221.5-1231.0 m

AGE	FORAMS	NANNOS	RAOS	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
				ABUND.	PRES.						
LATE CAMPANIAN	Effel1ithus augustus			F	N	C	Core Catcher				CaCO ₃ 1-0 (99) LIMESTONE (Chalky); white; and CHERT (variegated); red (10R 4/3) and dark brown (7.5YR 4/4). X-ray CC 7% Quar 1% Chlo 39% Amor 61% Cryst 2% K-Spar 4% Calc 48% Calc 5% Mica 35% Poly
						0					

Site 289 Hole Core 131 Cored Interval: 1231.0-1259.5 m

AGE	FORAMS	NANNOS	FOSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHOLOGIC DESCRIPTION
APTIAN			F N C	0	0.5		*	LIMESTONE, white, pinkish gray, orange brown, reddish brown. (colors gradational). Wavy flaser bedding at Section 1-20 to 29; bioturbated.
CAMPANIAN		<i>E. augustus</i> ?	F T P	1	1.0		*	ZEOLITE-FORAM-MICARB-BEARING, MAMMO LIMESTONE, white, pinkish gray; bioturbated.
APTIAN			F T P	2			*	SS 1-5 79% N 10% M 1% Py
APTIAN			F T P	2			*	HEAVY MINERAL ZEOLITE-MICARB-BEARING, GLASS-SHARD-RICH MAMMO LIMESTONE, reddish brown; bioturbated.
APTIAN			F R F	2			*	SS 1-48 30% G1 10% M 3% HM 1% Py
APTIAN			F C F	3			*	MAMMO-FELSPAR-HEAVY MINERAL-ZEOLITE-OPAQUE MINERAL-BEARING, GLASS-SHARD TUFF, grayish brown, with blebs of reddish brown; bioturbated.
APTIAN			F C F	3			*	SS 1-106 74% G1 10% Opaq 5% HM 3% Fsp 3% N
APTIAN			F C F	3			*	X-ray 1-106 34% Amor 6% X-Spar 2% Mont 66% Cryst 5% Mica 75% Paly 11% Quar 1% Chlo
APTIAN			F C F	3			*	Sponge spicule-micarb-glass-shard-zeolite-bearing mammo limestone, light olive gray, medium dark gray, pinkish white, white, wavy, flaser bedding; bioturbated; silicified at some intervals.
APTIAN			F C F	3			*	SS 2-12 27% G1 10% Z 5% S 1% HM
APTIAN			F C F	3			*	ZEOLITE-GLASS-SHARD-MICARB-BEARING, MAMMO LIMESTONE, light olive gray, medium dark gray, pinkish white, white, wavy, flaser and lenticular-bedded; bioturbated.
APTIAN			F C F	3			*	SS 2-76 84% N 7% M 5% G1 3% Z
APTIAN			F C F	3			*	CHERT, brownish black (5YR 2/1), dark reddish brown (5YR 3/4), with limestone blebs at Section 2-40, 65, 80 to 83, 85, 112 to 125, and 125.
APTIAN			F C F	3			*	X-ray 2-105-107 15% Amor 85% Cryst 2% Clin X-ray CC 2% Amor 98% Cryst 100% Calc

Site 289 Hole Core 131 Cored Interval: 1231.0-1259.5 m


Site 289 Hole Core 132 Cored Interval: 1259.5-1269.0 m

AGE	FORAMS	NANNOS	FOSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHOLOGIC DESCRIPTION
APTIAN			F N C	0	0.5			LIMESTONE, light olive gray, medium dark gray, pinkish white, wavy, flaser and lenticular bedding; bioturbated; basal part - yellowish brown.
APTIAN			F N C	1	1.0			HEAVY MINERAL-MAMMO-OPAQUE MINERAL-BEARING, ZEOLITE RICH, GLASS SHARD TUFF, grayish brown.
APTIAN			F N C	1				SS 2-50 71% G1 15% Z 5% Opaq M 3% N 3% HM 1% R
APTIAN			F N C	1				X-ray 2-50 52% Amor 48% Cryst 60% K-Spar 25% Mont
APTIAN			F N C	1				LIMESTONE, yellowish brown.
APTIAN			F N C	1				FELDSPAR-OPAQUE MINERAL-BEARING GLASS SHARD TUFF, grayish brown.
APTIAN			F N C	1				SS 2-76 87% G1 5% Fsp 5% Opaq 2% N 1% M
APTIAN			F N C	1				X-ray 2-75 69% Amor 31% Cryst 42% K-Spar 43% Mont
APTIAN			F N C	1				X-ray 2-87 1% Amor 98% Cryst 4% Quar 1% Mica
APTIAN			F N C	1				BASALT
APTIAN			F N C	1				NG/N4, dry, medium light gray to medium dark gray 5Y 4/1/56Y 4/1, wet, olive-gray to dark greenish gray
APTIAN			F N C	1				The top 10 cm is a chill zone, grading downwards from a fine variolitic texture to an intergranular texture. The groundmass consists of hollow plagioclase, variolitic pyroxene, quench magnetite, and chloritized glass.
APTIAN			F N C	1				The basalt consists of two alternating textural types which grade into one another: (1) coarser intergranular texture: section 2-92 to 150, Section 3-0 to 48, 66 to 150, Section 4-0 to 12 and 65 to 150 (2) fine variolitic texture: Section 3-48 to 78, Section 4-12 to 65.
APTIAN			F N C	1				The intergranular basalt contains approximately equal amounts of plagioclase, pyroxene, <5% magnetite, and a few percent chlorite. Veins <1.5 cm common in Sections 2 and 3, chlorite calcites, quartz, 10% 3/4 yellowish brown unidentified material (opaline or jasperoid?), vesicles <2 mm throughout, <1% volcanic. Indistinct to distinct thin flow laminae common throughout.

Site 289 Hole Core 132 Cored Interval: 1259.5-1269.0 m

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Site 289 Hole Core Interval: 1269.0-1271.0 m

AGE	FORAMS	NANNOS	RADS	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
				FOSSIL	ABUND.						
						0					
						1	0.5 1.0	Empty			
											

BASALT
 Like basalt of Core 132, intergranular
 texture section 1-107, 118, granoblastic
 texture at Section 1-118 to 150.