OCEAN DRILLING PROGRAM

LEG 129 SCIENTIFIC PROSPECTUS

OLD PACIFIC CRUST

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ABSTRACT

The main objective of Leg 129 is to recover Jurassic sediments and volcanic basement from the Pigafetta and East Mariana basins of the western Pacific. Six sites have been selected as the main targets,[1] although it is recognized that operational constraints may allow drilling only three of them. If successful, these sites will yield the first Jurassic samples ever recovered from the Pacific "superocean" of that time. They will calibrate the oldest magnetic lineation patterns predicted to be Late to Middle Jurassic in age. Two or three of these sites will also sample late Early and early Late Cretaceous volcanic materials that we have imaged through with multichannel seismic surveys. These sites will provide geochemical reference sections for "input" to the western Pacific subduction zones and provide information on the crustal magnetization and paleolatitude of the Pacific plate in the Jurassic. Finally, data from these sites will elucidate the physical state of some of the oldest sediments and crust remaining beneath the seafloor.

INTRODUCTION

The correlation of Mesozoic magnetic anomaly sequences in the Pacific Ocean by Larson and Chase (1972) indicates that the world's oldest ocean crust lies centered in the far western Pacific and that isochrons become concentrically younger in approximately radial fashion (Fig. 1). Recent magnetic anomaly mapping by Handschumacher and Gettrust (1985), Tamaki et al. (1987) (Fig. 2), and Handschumacher et al. (1988) (Fig. 3) has revealed the oldest portion of this tectonic pattern and has extended the Mesozoic magnetic reversal time scale from M29 of Cande et al. (1978) to M37. The oldest M-lineations may have recorded the magnetic reversal/seafloor spreading history of the early Late Jurassic (~165 Ma), which was preceded by a magnetic quiet zone ranging back to the Middle Jurassic (~175 Ma).

The inference that the M17 and later isochrons coincide with Jurassic sediments and basement rocks is based entirely on conclusions drawn from geophysical data such as those just cited (Fig. 1). No Jurassic material has ever been recovered from this region, whose size is approximately that of the contiguous United States or western Europe. Past attempts to drill and recover Jurassic sediments and basement rocks in this area have been frustrated by ubiquitous chert layers of generally Late Cretaceous age and by widespread but probably not totally ubiquitous volcanic material of late Early and early Late (hereinafter refered to as "middle") and Late Cretaceous age that blanketed much of the older strata in the area. These geologic units and the lack of multichannel seismic data to define their depths in section, thicknesses, and lateral boundaries have led to previous "blind drilling"

[1]In order to meet deadlines associated with the Leg 129 schedule, this prospectus was assembled and published prior to the last geophysical site survey cruise that will be integrated with existing data to determine final site locations. These sites and the associated operational schedules may be slightly different from the ones described in this document, but the overall goals of the leg will not change.

on Jurassic basement locations (Fig. 1) that have all terminated in Cretaceous material of various types (cherts, Deep Sea Drilling Project Site 452; volcaniclastics, DSDP Sites 199 and 585; basalt flows and sills, DSDP Sites 61, 169, and 462).

The recent magnetic anomaly mapping cited above, along with joint multichannel seismic expeditions by French and American investigators (Abrams et al., 1988), have led to a much better understanding of the tectonic and geologic history of the area. These investigations have also provided seismic imaging of drill sites in the Pigafetta and East Mariana basins (Fig. 4), where Jurassic sediments and Jurassic oceanic crust may be drilled and recovered with the advanced drilling technology aboard *JOIDES Resolution.*

OBJECTIVES OF THE PROPOSED DRILL SITES

Age Calibration of Jurassic Magnetic Reversals

The available magnetic and seismic data suggest that the Pigafetta and East Mariana basins are underlain by oceanic crust of Late Jurassic to probable Middle Jurassic age (Figs. 5 and 6). The younger parts of the basins toward the northwest may be Kimmeridgian to Oxfordian (anomalies M22 to M25; Late Jurassic), whereas the middle parts may be Oxfordian to Callovian (anomalies M29 to M37), that is, ~160-165 Ma. Toward the southeast, within the Jurassic magnetic quiet zones, the age of the crust may be as old as Bathonian to Bajocian (Middle Jurassic, ~165-175 Ma), found to be a time of extremely frequent magnetic reversals by Steiner et al. (1987).

So far the oldest magnetic anomalies dated in the world oceans are M23 to M26 (Fig. 5), which have been sampled at two sites in the North Atlantic (DSDP Sites 100 and 105). Several sites on younger M-anomalies have yielded a reasonable calibration for the post-M25 anomaly sequence. Drilling in the area of older anomalies of the M-series offers an exceptional opportunity to extend the geomagnetic time scale further back into the Jurassic, and possibly to calibrate the series of reversals described from land sections by Steiner and Ogg (1988) (Fig. 6).

Within the Jurassic quiet zone of Pigafetta Basin, Handschumacher et al. (1988) have observed an important change in the character of the magnetic signature. Small-amplitude anomalies were observed on all aeromagnetic tracks that extend southeast of M37 but could not be correlated. Farther southeast of this magnetic quiet zone an abrupt change in amplitudes and regional field intensity occurs that has been interpreted as a possible structural boundary roughly parallel to the isochrons. This area may represent the location of the original microplate from which the present-day Pacific plate evolved (Handschumacher et al., 1988). It is also possible that it could mark the edge of the middle Cretaceous volcanic complex that extends farther south.

Drilling at the Pigafetta and East Mariana basin sites will allow determination of the age of the older M-anomalies, determination of the age of the crust within the Jurassic quiet zone, and investigation of the nature of the crust in the magnetic high amplitude-low regional field area. The predicted ages of these sites (Fig. 5) range from Oxfordian to Bajocian (160-175 Ma).

Jurassic Sediments and Early History of the Ocean

The main interest in Jurassic sediments from the Pacific is that they chronicle the paleoenvironment of the Jurassic superocean, which covered two-thirds of the Earth at that time, but for which we have no direct record. The only samples of pelagic "deep sea" Jurassic sediments come from Tethyan fold belts and DSDP sites in the proto-Atlantic, both of which correspond to relatively restricted marine conditions. Previous attempts to recover Jurassic sediments in the Pacific have failed. The most recent attempts were at locations where thick lava flows and sills of middle to Late Cretaceous age proved impossible to penetrate (DSDP Site 461, Nauru Basin), or where thick accumulations of volcaniclastic material had expanded the sedimentary section beyond the capabilities of the drill ship (DSDP Site 585, East Mariana Basin). Multichannel seismic profiles reveal that this latter site probably was located in a fracture zone trough next to closely adjacent seamounts and guyots that provided an anomalous thickness of volcaniclastic turbidites covering anomalously deep basement.

The sedimentary section on seismic profiles through Pigafetta Basin resembles that of the Ptolemy Basin located north of the Marcus-Wake swell, where DSDP Site 307 was drilled to basement of Berriasian (earliest Cretaceous) age beneath 300 m of sediment on anomaly M21. The average sediment thickness in the East Mariana Basin is about 300-500 m, and there is a very good chance of obtaining sediments of Jurassic age. The main difference between the sites proposed here and those drilled previously, apart from the older age of the basal sediments, is the age of the chert layers. The chert is expected to be younger in the Pigafetta Basin and younger still in the East Mariana Basin because of the differences in time of equatorial crossing for the three areas (Lancelot and Larson, 1975). Sediment thicknesses and acoustic signatures appear compatible with this interpretation. We intend to sample Jurassic sediments in the area of the M-anomalies and within the Jurassic quiet zone, where no age determination can be made otherwise.

Geochemical Reference Sections

The proposed drilling locations may also fulfill in part objectives commonly referred to as "geochemical reference sections." These objectives include determining the composition of sediments and igneous ocean crust adjacent to a subduction zone for comparison with the geochemical characteristics of the neighboring arc volcanism. In the western Pacific the main variable on the "input" side of the geochemical reference equation may be the presence or absence of large volumes of middle Cretaceous volcanic material in the deep basins now being subducted. The petrology, igneous or sedimentary nature, and depth in section of this material would greatly affect the geochemical "output" signature at western Pacific island arcs. It probably would have much greater variability than the original Jurassic ocean crust and is much more accessible to the drill in the western Pacific. Also, drilling into basement in this region offers a unique opportunity to assess the *in-situ* physical properties of old oceanic crust created at a fast spreading center, because present tectonic models assume that the Pigafetta and East Mariana basins were both created at 6-8 cm/yr spreading half-rate.

While none of the sites proposed for Leg 129 drilling in the Pigafetta or East Mariana basins are directly adjacent to their associated subduction zones, seismic profiles throughout both of these basins suggest that the proposed sites have acoustic sections typical of each basin in question. It is unlikely that any significant diagenesis or other alteration will occur at these sites between now and their eventual subduction. Furthermore, all sites occur in fracture zone-bounded "compartments" that extend to the western Pacific subduction zones. Thus the nature of the sedimentary and crustal sections can be related to those specific subduction zones and their associated backarc volcanism.

Cretaceous Volcanic Complex

It is quite possible that one of the East Mariana Basin sites (EMB-1) and the southeasternmost Pigafetta Basin site (PIG-4) will encounter material generated by the middle Cretaceous volcanic event, either as volcaniclastics or as solid sills and flows. However, multichannel seismic data and recent magnetic anomaly mapping allow location of sites typical of large parts of the regional geology of those basins. We will drill through the middle Cretaceous volcanics to underlying seismic reflectors that may be older material. Sampling this middle Cretaceous volcanic complex will provide additional understanding on the timing, dimensions, and petrology of this major igneous province. In addition, sampling the seismic stratigraphy at these locations will allow "calibration" of the seismic stratigraphy in large parts of both of these basins.

Crustal Magnetization and Paleolatitudes

In addition to what we consider to be the primary objectives (age of the oldest magnetic lineations and Jurassic paleoenvironments), a number of other objectives could be met with these drill sites. Crust magnetization objectives also are within the scope of Leg 129 drilling. Paleolatitudes measured on basement rocks and logging measurements that may recover the complete remanent magnetization vector are also of prime interest. They will allow reconstruction of the latitudinal motion and rotation of the Pacific plate during the Jurassic. This latter point is especially important for modeling the overlying sedimentary stratigraphy that is very sensitive to crossings of the Equatorial high-productivity zone.

GEOPHYSICAL SURVEYS

Magnetic lineations indicate that the basement we have imaged is Middle to Late Jurassic in age and is presumably overlain by deep-sea pelagic sediments representing the paleoenvironment of the "superocean" of that age. The seismic reflection data and velocity structure are illustrated in Figures 7-11 for drill site locations in the Pigafetta and East Mariana basins. Reflection/refraction data analyses provide answers to two first-order questions that have been raised concerning the drilling of oceanic crust in these oldest Pacific basins: (1) Can depth to oceanic crust be determined in these basins? (2) If basement is identified with refraction/reflection data, can it be shown that this basement does not include thick (>500 m) sequences of Cretaceous volcanic deposits overlying Jurassic oceanic crust (as occurs in the Nauru Basin, DSDP 462A, and the East Mariana Basin, DSDP 585), thus making the crust impossible to reach? Rough, unconformable horizons have been imaged and interpreted to be the top of oceanic crust in both the East Mariana and Pigafetta basins, usually occurring beneath a high-amplitude, low-relief, and quite continuous horizon occurring 0.2-0.4 s below the seafloor. Sonobuoy velocity solutions consistently indicate that crustal velocities begin at or just below this dominant horizon. Depth to basement is well established in the East Mariana and Pigafetta basins at an average of 300-500 m (Abrams et al., 1988).

SITE DESCRIPTIONS

Proposed Sites PIG-1 and PIG-2

These two sites are located in the northwest part of Pigafetta Basin, where the magnetic anomalies are well defined and where the total sediment thickness is estimated regionally to be ~300-400 m, based on single-channel seismic data from this and adjacent basins (Fig. 7). Exact locations for these sites will be determined from the MCS data acquired on board the *N/O Suroit* in August and September 1989. As a typical example of the seismic stratigraphy here (and the available data in general), Figure 7 shows an analog seismic record made on *Conrad* 1205 at M32, M33. We will be looking for similar locations in the vicinity of well-defined anomalies M30 and M36, hoping to compare Middle to Upper Jurassic (?Callovian) sediments from the Pacific with those recovered in the central Atlantic at DSDP Sites 105 and 534. The single-channel seismic data in this area, and our multichannel data to the southeast, suggest that subsequent middle Cretaceous volcanic sediments and/or hard rocks are not present here. DSDP Site 307 to the north and DSDP Site 452 to the south both suggest that middle to Upper Cretaceous chert will be present in the first 100 m of the section, owing to very slow "brown-clay" sedimentation in the past 80-100 m.y. Both PIG-1 and PIG-2 would serve to satisfy magnetic-anomaly calibration, paleoenvironmental, and geochemical reference goals.

Proposed Site PIG-3

This site is located within the Jurassic magnetic quiet zone in the central part of the Pigafetta Basin, approximately 150 nmi southeast of the last well-defined magnetic anomaly (M37), in an area where the MCS profile (Fig. 8) shows basement at ~0.6 s below the seafloor. As at PIG-1 and PIG-2 we expect middle to Upper Cretaceous cherts to occur within the first 100 m of the section, overlain by post-Campanian brown clay. There may be minor thickening of the mid-Cretaceous section by volcaniclastic input, but there is no indication in the seismic records (Fig. 8) that flat-lying sills and flows are present here as they were at DSDP Site 462 in Nauru Basin.

Jurassic basement in this area is correlated with the undulating, hyperbolic reflectors labeled "Bsmt." in Figure 8. At PIG-3 this reflector occurs at 8.0 s two-way reflection time underlying 0.58 s of sediment. Sediment velocity analyses show velocities increasing from 1.87 km/s to 2.57 km/s with an average sediment velocity of 2.4 km/s and a total sediment thickness of 701 m. These velocities determined from normal moveout times are similar to a section of slightly younger age and similar environment recovered at DSDP Site 307.

Long-range sonobuoy 22 was recorded 50 nmi southeast of PIG-3, where the acoustic basement reflector is flatter and the overlying sediment section thinner than at PIG-3. This suggests the possibility of middle Cretaceous volcanics at the location of sonobuoy 22 that are not present at PIG-3, or that the flat-lying reflection simply develops more relief (becomes tectonized?) in the area of PIG-3. In either case we believe that the onset of velocities characteristic of "normal" oceanic crust recorded by sonobuoy 22 correlates to the basement ("Bsmt.") reflector at PIG-3.

Objectives of drilling at proposed site PIG-3 include dating of the Jurassic quiet zone and investigating the nature of low-amplitude magnetic anomalies, as well as the previously mentioned paleoceanographic and geochemical reference goals.

Proposed Site PIG-4

This site at the southeastern end of Pigafetta Basin is the most enigmatic, and therefore the most interesting, of the four proposed sites in this basin. It lies beyond the Jurassic magnetic quiet zone of Handschumacher et al. (1988) in an area of high-amplitude, nonlineated magnetic anomalies associated with an anomalously low regional magnetic field. The seismic reflection character of this area is considerably different from the hyperbolic basement reflections seen at PIG-3 in the Jurassic quiet zone. The reflection profile across PIG-4 (Fig. 9) is characteristic of the southeastern section of Pigafetta Basin beyond the magnetic boundary of Handschumacher et al. (1988). Throughout this area it shows a uniformly flat-lying, very reflective surface about 0.25 s below the sea floor. In some areas, notably at PIG-4, an unconformable reflector of relatively low relief occurs below it that is correlated with basement at PIG-4. These flat-lying reflectors terminate very close to Handschumacher et al.'s magnetic boundary and are replaced by more undulating, hyperbolic basement reflectors in the Jurassic magnetic quiet zone. Correlation of these two types of seismic reflection and magnetic signatures is not perfect, as there are some areas in the Jurassic magnetic quiet zone where flat-lying reflectors occur, such as the sonobuoy 22 location referred to in the PIG-3 description above.

At least two hypotheses can be advanced for the origin of this "seismic smooth/ magnetic rough" zone. On the basis of the magnetics alone, Handschumacher et al. (1988) postulated it as the original Pacific microplate of Hilde et al. (1976). In this hypothesis it would be the original nucleus and oldest surviving piece of Pacific plate and would also be the oldest ocean crust left on the planet. Our extrapolation of the M-lineations time calibration predicts it to be late Bajocian, about 175 Ma (Fig. 5). Its geographic-tectonic location argues strongly for this possibility. However, modern-day microplates on the East Pacific Rise (e.g., the Easter and Juan Fernandez microplates) are characterized by correlatable, although nonparallel, magnetic lineations and very rough volcanic basement, both owing to very close poles of relative motion. We propose that the "seismic smooth/

magnetic rough" zone is a product of the middle Cretaceous volcanic event. It is probably the northwesternmost location of pervasive middle Cretaceous volcanism in the deep sea although evidence of such volcanism is sporadically present in the Jurassic magnetic quiet zone to the northwest and in seamounts bounding M-lineations of Pigafetta Basin.

As at the other sites proposed in Pigafetta Basin, we shall probably encounter chert in the first 100 m of the section underlying 80-100 m.y. of "brown-clay" deposition. The sediment section at PIG-4 from the seafloor down to the flat reflector labeled "Chert?-Volc?" in Figure 9 is 0.30 s. Sediment velocity analyses indicate an average sediment velocity of 2.0 km/s for a total thickness of 300 m of section down to "Chert?-Volc?". The interval from "Chert?-Volc?" to "Bsmt." is 0.10 s with an upper bounded interval velocity of 2.3 km/s (interval thickness of 121 m) for a total thickness from the seafloor to "Bsmt." of 421 m.

Sonobuoy 21 was deployed approximately 60 km southeast of the PIG-4 location. Velocity solutions indicate that crustal velocities begin at 0.33 s below the seafloor, which correlates to a low-amplitude reflection below the dominant "Chert?-Volc?" horizon. At the PIG-4 site location this weak reflection is also observed 0.1 s below the "Chert?-Volc?" reflector and is identified as high-velocity basement.

In addition to those listed with younger Pigafetta Basin sites, major objectives at PIG-4 include characterization of basement in this "seismic-smooth/magnetic rough" region.

Proposed Site EMB-1

This site lies on magnetic lineation M34 and is typical of the seismic stratigraphy found in the East Mariana Basin (Fig. 10). DSDP Site 199 to the east of EMB-1 encountered Tertiary turbidites in the first 300 m of the section overlying Upper Cretaceous-lowermost Tertiary cherts, and it is probable that the flat-lying, coherent reflectors in the upper 0.18-0.2 s of the section at EMB-1 (Fig. 10) correspond to those same turbidites and cherts. About 0.37 s of sediment lies below the seafloor on top of a low relief, very reflective, and continuous horizon labeled "Chert?-Volc?" in Figure 10. Velocity analysis yields an average interval velocity of 1.8 km/s, corresponding to 329 m of section down to this horizon. It may be that this very widespread, prominent horizon is Upper Jurassic chert, or a manifestation of the middle Cretaceous volcanic complex either as volcaniclastics or solid flows and sills. It is unlikely to be true Jurassic basement because it is underlain by unconformable weak reflections ("Bsmt." in Fig. 10). At EMB-1 the interval between "Chert?-Volc?" and "Bsmt." is 0.14 s with a velocity of 1.8-3.0 km/s corresponding to a 171 m interval, or a total thickness of 500 m of section from the seafloor to "Bsmt." at EMB-1.

Sonobuoy 7 was recorded 25 nmi southeast of EMB-1 and has similar acoustic stratigraphy. Crustal velocities begin at 0.49 s below the seafloor, where a 4.725 km/s arrival was recorded. This is well below the level of the "Chert?-Volc?" horizon in Figure 10 and coincident with the faint "Bsmt." reflector.

The prime objectives at this site are to provide a stratigraphic date on magnetic anomaly M34, a "ground truth" calibration of the seismic stratigraphy of the East Mariana Basin, and a geochemical reference section for the Mariana Trench section of the western Pacific subduction zones.

Proposed Site EMB-2

This site lies within the Jurassic magnetic quiet zone of the East Mariana Basin and is located in an area where the "Chert?-Volc?" horizon displays an unusual amount of relief but is otherwise similar to EMB-1 stratigraphically. The upper 0.23 s of flat-lying coherent reflections is believed to represent the Tertiary turbidites overlying Late Cretaceous-early Tertiary cherts recovered at DSDP Site 199.

Velocity analysis at EMB-2 reveals 0.37 s of 1.8 km/s material (thickness = 329 m) overlying the "Chert?-Volc?" horizon. The interval between "Chert?-Volc?" and the weaker, discontinuous and unconformable reflector labeled "Bsmt." (Fig. 11) consists of 0.11 s of 1.8-3.0 km/s material (thickness = 133 m), resulting in a total sedimentary thickness of 462 m.

Sonobuoy 18 was deployed just southwest of site EMB-2 in an area where the "Chert?-Volc?" horizon is flat-lying. Velocity solutions indicate the onset of crustal velocities at 0.3-0.35 s below the seafloor at the reflection labeled "Chert?-Volc?" or just below this prominent horizon. Both the "Chert?-Volc?" and the lower amplitude, discontinuous "Bsmt." reflectors appear to deepen in the immediate vicinity of EMB-2, but we believe that the crustal velocites recorded by sonobuoy 18 correspond to the reflection identified as "Bsmt."

Objectives for proposed site EMB-2 are essentially the same as those for PIG-1. There is additional interest in drilling the two East Mariana Basin sites to make interbasinal correlations with results of drilling in the Pigafetta Basin.

OPERATIONS PLAN

Leg 129 is scheduled to depart from Guam on 24 November 1989 after a 5-day port call and return to Guam on 19 January 1990 after 56 operational days at sea (Tables 1 and 2). The operations plan must remain somewhat flexible so that operations can be adjusted to either difficult or surprisingly successful drilling. Basement penetration of 100 m is planned for only the first drill site, with 50 m of basement penetration planned for subsequent sites.

The operations plan will be focused to optimize drilling, downhole experiments, and recovery of Lower Cretaceous/Jurassic sedimentary material and Jurassic basement at all sites. The main problem to overcome in obtaining these objectives is associated with Upper Cretaceous chert/porcellanite beds that occur high in the sedimentary sequence. These beds cause drill-string torquing and hole-collapse problems. High-pressure pumping required to keep the hole clean of chert chips tends to "firehose" away soft sedimentary material in the underlying formations, making a reconstruction of the age and physical stratigraphy at the site difficult in the older sedimentary material. When basement is reached, the recovery problem is alleviated, but the problem of drill-string torquing and hole collapse remains.

Our primary drilling strategy is to rely on rotary coring. We also hope to improve the situation at the first site drilled by setting a reentry cone and casing off the unstable chert formation. If most of the chert/porcellanite occurs in the upper 200 m of the drill hole, then it should be possible to isolate this portion of the section and drill with reduced pump pressure in the older sedimentary units to enhance core recovery. A reentry cone and casing will be set at PIG-1, PIG-2, or PIG-3, depending on the thickness of the soft sediment section above the first chert occurrence (Table 1). The topmost soft sediment section will have to be a minimum of ~60 m to wash in a reentry cone and conductor casing. The hole will then be drilled down to 200-250 mbsf, and smaller diameter casing set to isolate the chert sequence. Standard rotary (RCB) drilling will then proceed, if possible with reduced pump pressure in the older sediments, below the casing shoe to a maximum depth of 100 m into basement. Depending on results at the first site, this technique may be repeated at a subsequent site. If hole stability and recovery prove to be less of a problem, owing to the enhanced stability of *JOIDES Resolution*'s positioning and drilling systems, then it may be possible to reduce the downhole hardware commitment at subsequent sites. Subsequent holes may be drilled with less casing, using only enough conductor casing to stabilize the reentry cone, a mini-cone, or as a single-bit hole with no reentry capabilities.

There will probably be sufficient time to drill only three sites (Table 1), although more sites are desirable. The optimum program of sites is PIG-1 or PIG-2 drilled first, the second site at PIG-3, the third site at PIG-4, and the fourth site at EMB-1 or EMB-2. The first three of these sites should increase monotonically in drilling difficulty and basement age, while the fourth site will test stratigraphic correlations to the East Mariana Basin. In addition, the total amount of drill string required increases for the East Mariana Basin sites. Maximum drill-string length required on the leg should not exceed 6700 m, and maximum reentry cone deployment depth should not exceed 6100 m.

The maximum logging program will be accomplished at the first site, where reentry and casing should offer the most protection for the downhole measurements. The maximum logging program will consist of the standard suite of tools [seismic stratigraphy, litho-porosity, and geochemical combinations, and formation microscanner (FMS)] in the entire hole, plus the borehole televiewer or FMS, the magnetometer/susceptibility tool, and one to several packer measurements in basement. This program may be reduced at subsequent sites to the standard Schlumberger suite plus the magnetometer/susceptibility tool.

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Table 1. Summary Site Information, Leg 129[1]

Site	Lat./Long.	Water Depth	Penetration Sed.	Penetration Bsmt.	Drilling	Logging (days)	Total
Leg 129 departs Guam on 24 November 1989							
PIG-1	22°30'N 151°30'E	5885	345	100	17.9	4.0[2]	21.9
PIG-3	19°30'N 155°56'E	5580	701	50	12.6	2.0[3]	14.6
PIG-4	17°29'N 158°44'E	5680	421	50	9.0	2.0[3]	11.0
Alternate Sites:							
(Alternate for PIG-1)							
PIG-2	20°18'N 152°35'E	5885	345	100	17.9	4.0[2]	21.9
(Alternates for PIG-3 and PIG-4)							
EMB-1	13°39'N 152°19'E	5920	500	50	9.8	2.0[3]	11.8
EMB-2	12°43'N 154°27'E	5950	462	50	9.2	2.0[3]	11.2

[1] Locations tentative; site survey to be completed in early September 1989.
[2] Includes standard logs plus BHTV, mag/susc, and packer in basement.
[3] Includes standard logs plus mag/susc in basement.

Table 2. Leg 129 Drilling Schedule[1]

Leg 129 begins with port call in Guam on 22 November 1989, departing Guam on 24 November 1989.

			Time on Site	Transit Time
Transit from Guam to PIG-1				2.8
Arrive	PIG-1	26 November	21.9	
Leave	PIG-1	18 December		
Transit from PIG-1 to PIG-3				1.3
Arrive	PIG-3	19 December	14.6	
Leave	PIG-3	3 January		
Transit from PIG-3 to PIG-4				0.8
Arrive	PIG-4	4 January	11.0	
Leave	PIG-4	15 January		
Transit from PIG-4 to Guam				3.5
Arrive	Guam	19 January 1990		
			Total Time	55.9

[1]Locations tentative; site survey to be completed in early September 1989.

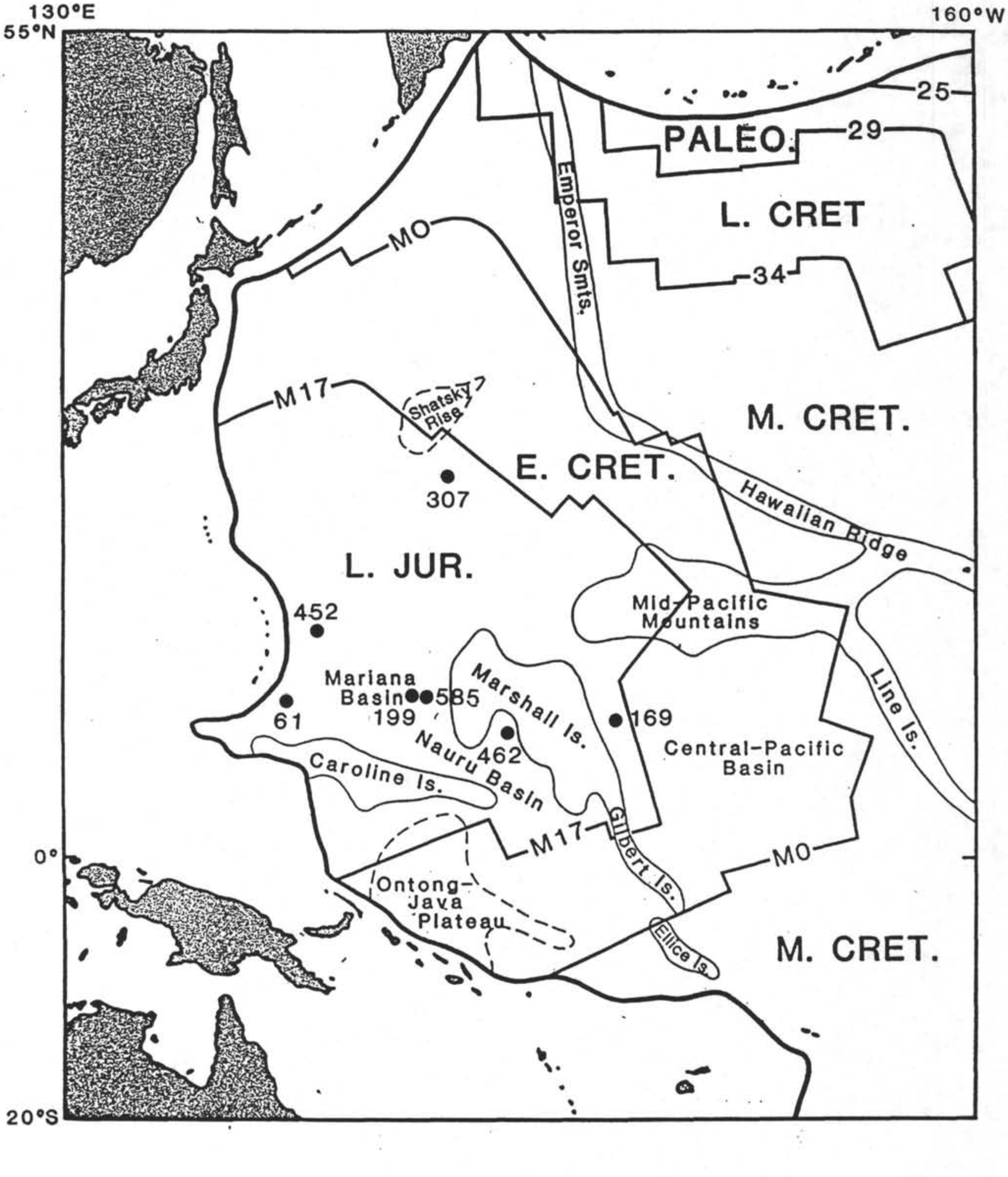


Figure 1. Bedrock isochrons determined from magnetic anomaly lineation mapping on the Pacific plate (from Larson et al., 1985) superimposed on groups of islands, atolls, and guyots in the western Pacific Ocean. Solid circles locate DSDP Sites 61, 169, 199, 307, 452, 462, and 585.

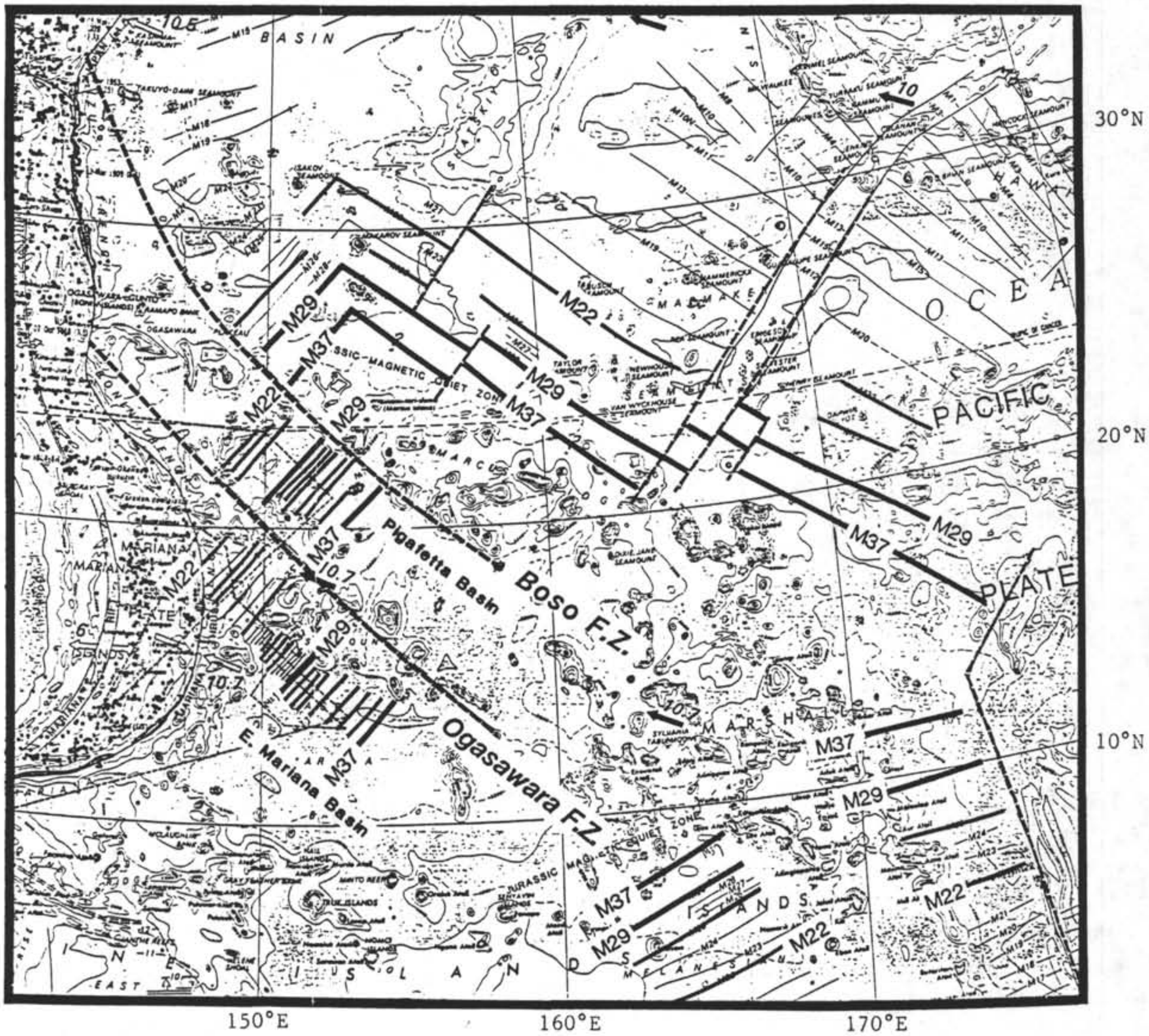


Figure 2. Jurassic magnetic lineations of the western Pacific superimposed on regional bathymetry (from Tamaki et al., 1987).

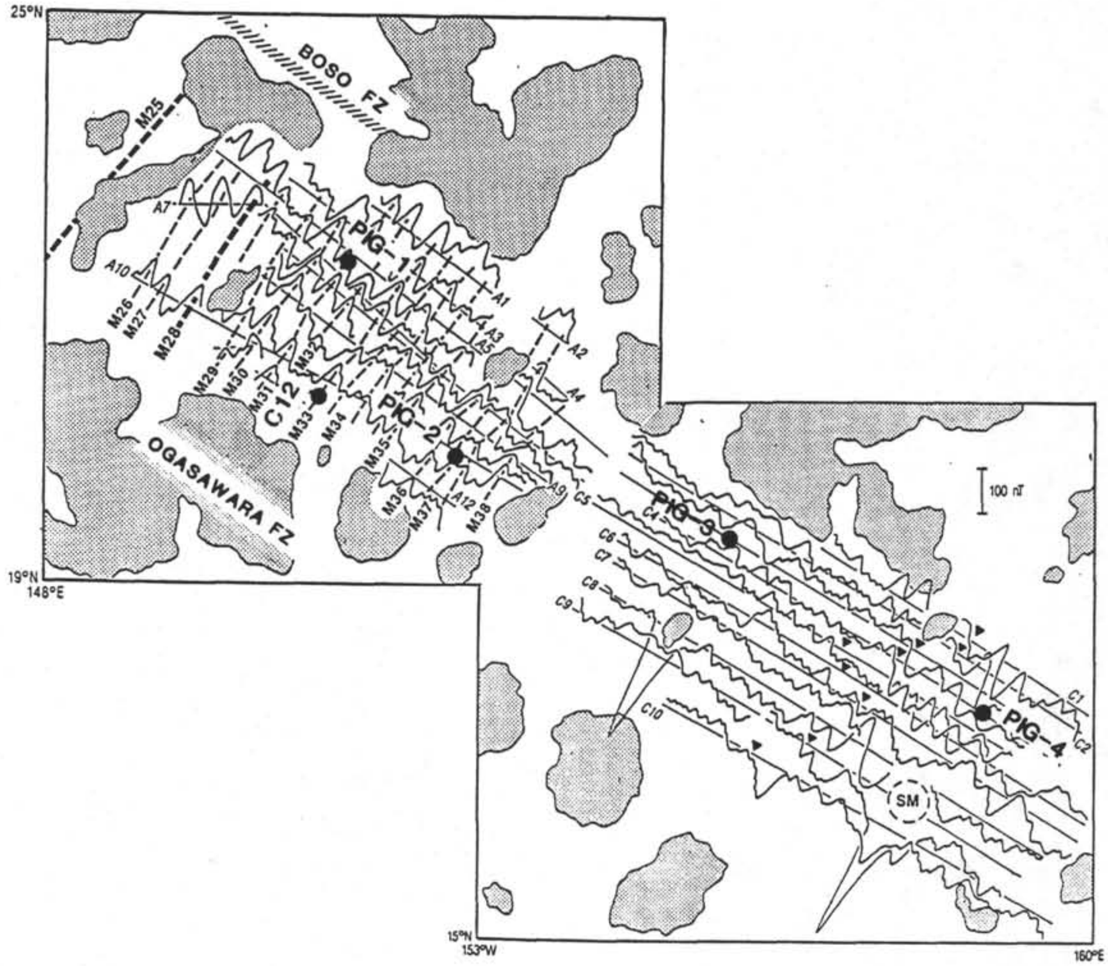
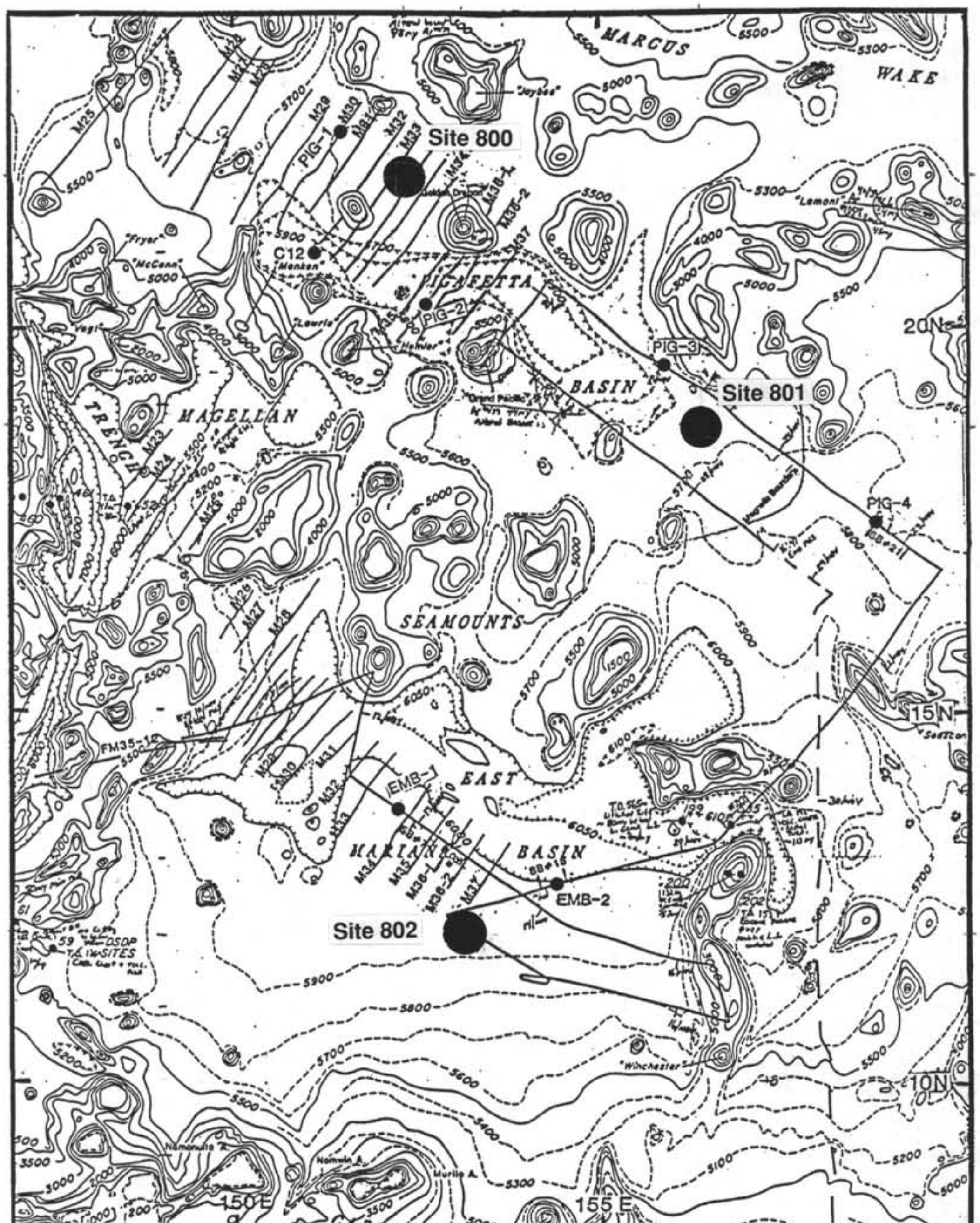


Figure 3. Aeromagnetic anomaly profiles across Pigafetta Basin from Handschumacher et al. (1988). Note low amplitude of magnetic anomaly lineations (<100 nT). Also note that numbering of M-sequence from M29 to M38 is one number larger for each lineation here than in other places in this proposal because we believe that M30 of Handschumacher et al. (1988) correlates to M29 of Cande et al. (1978). Triangles in the Jurassic quiet zone show where individual anomaly profiles become disturbed to the southeast. PIGs are proposed drill site locations. C12 (from *Conrad* 1205) indicates the location of a single-channel seismic record characteristic of the northwestern Pigafetta Basin.



Location of sites drilled during Leg 129 (Sites 800, 801, and 802) superimposed on Jurassic magnetic lineations and regional bathymetry (in meters) of the East Mariana and Pigafetta basins. Further information is available in the Leg 129 Scientific Prospectus, published in the October 1989 issue of the JOIDES Journal, and the Leg 129 Preliminary Report, which will appear in the June 1990 issue.

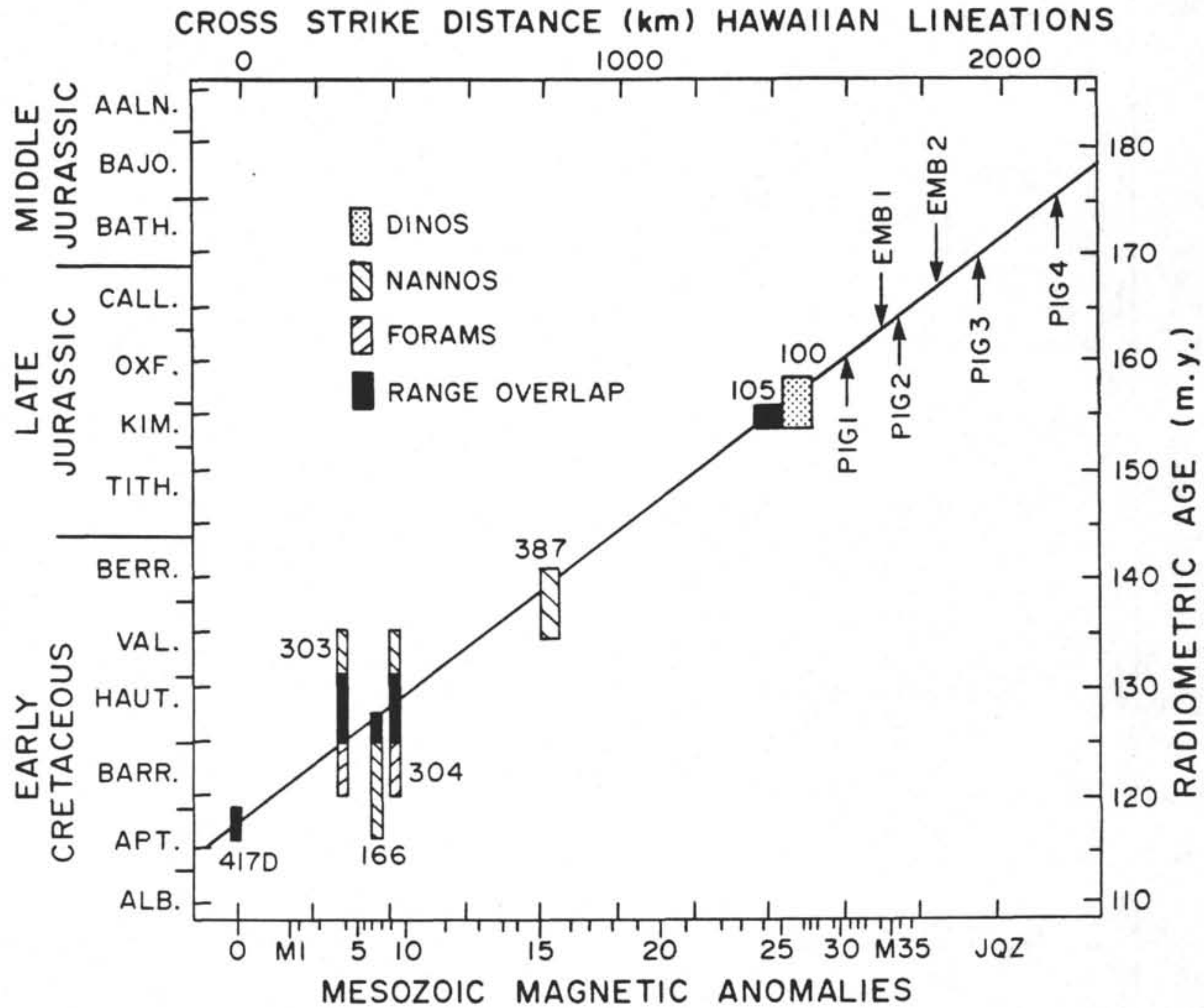


Figure 5. Time calibration plot of the Mesozoic magnetic anomalies M0 to M37 and the preceding magnetic quiet zone. Magnetic anomalies plotted as cross-strike distance across the Hawaiian lineations for M0 to M25. M25 to M37 are normalized to that parameter after Handschumacher et al. (1988). Geologic time scale and radiometric ages are from Harland et al. (1982) as modified by Kent and Gradstein (1985) at the Tithonian/Kimmeridgian boundary. Oldest paleontologic ages in various DSDP holes (numbered) shown as rectangles. Vertical lengths of rectangles show paleontological age ranges from DSDP Initial Reports except for 100 (Zotto et al., 1987) and 105 (Gradstein and Sheridan, 1983). Horizontal lengths show magnetic age ranges from Larson and Hilde (1975) for DSDP Sites 303, 304, 166, 100, and 105, and DSDP Initial Reports for Sites 387 and 417D. Predicted ages of proposed drill sites (PIGs and EMBs) are shown.

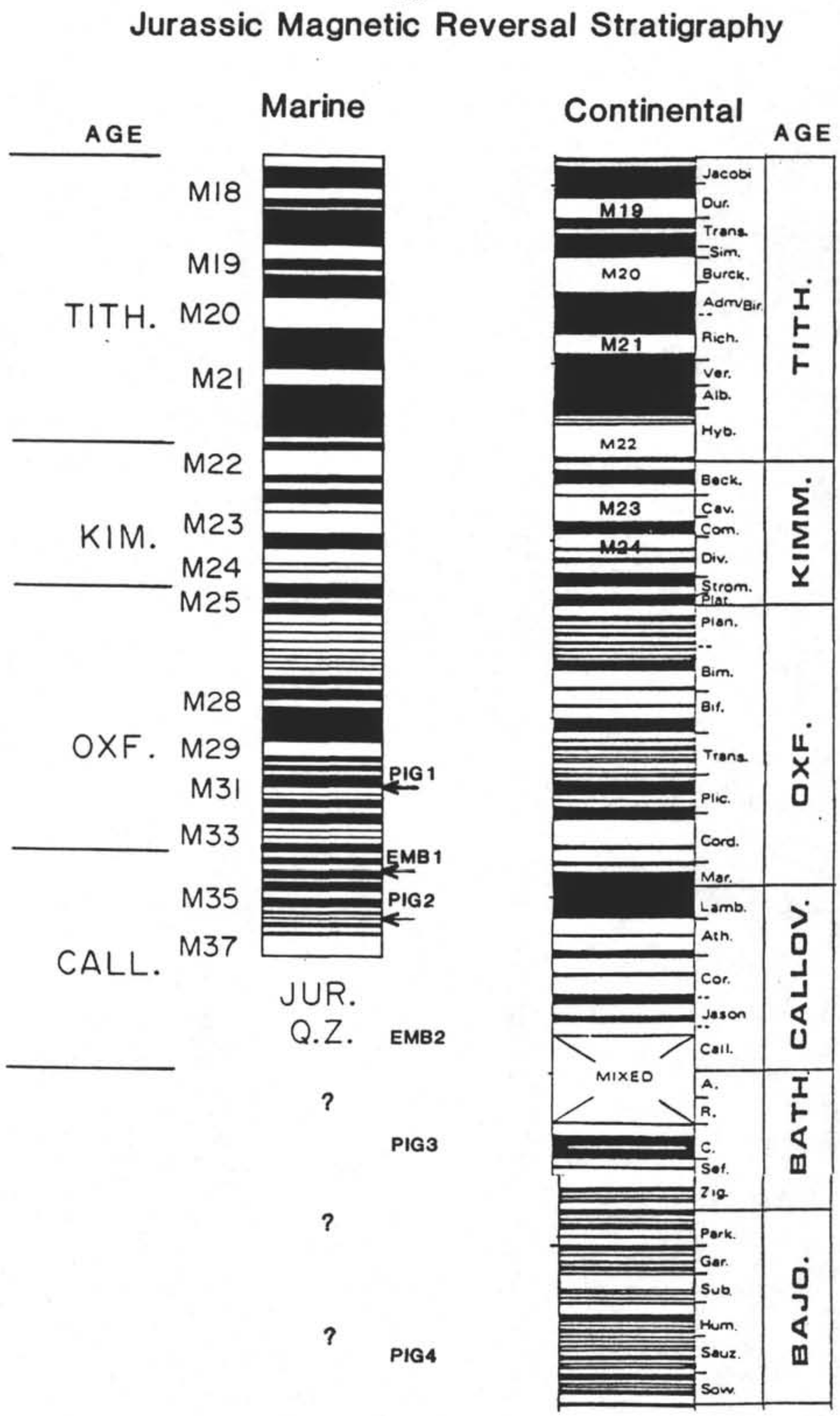


Figure 6. Jurassic magnetic reversal time scale determined by marine measurements (Larson and Hilde, 1975, for M17 to M25; Cande et al., 1978, for M26 to M29; Handschumacher et al., 1988, for M30 to M37) and continental measurements (Steiner and Ogg, 1988). Geological calibration of marine time scale from correlation line in Figure 5. Predicted ages of proposed drill sites (PIGs and EMBs) are shown.

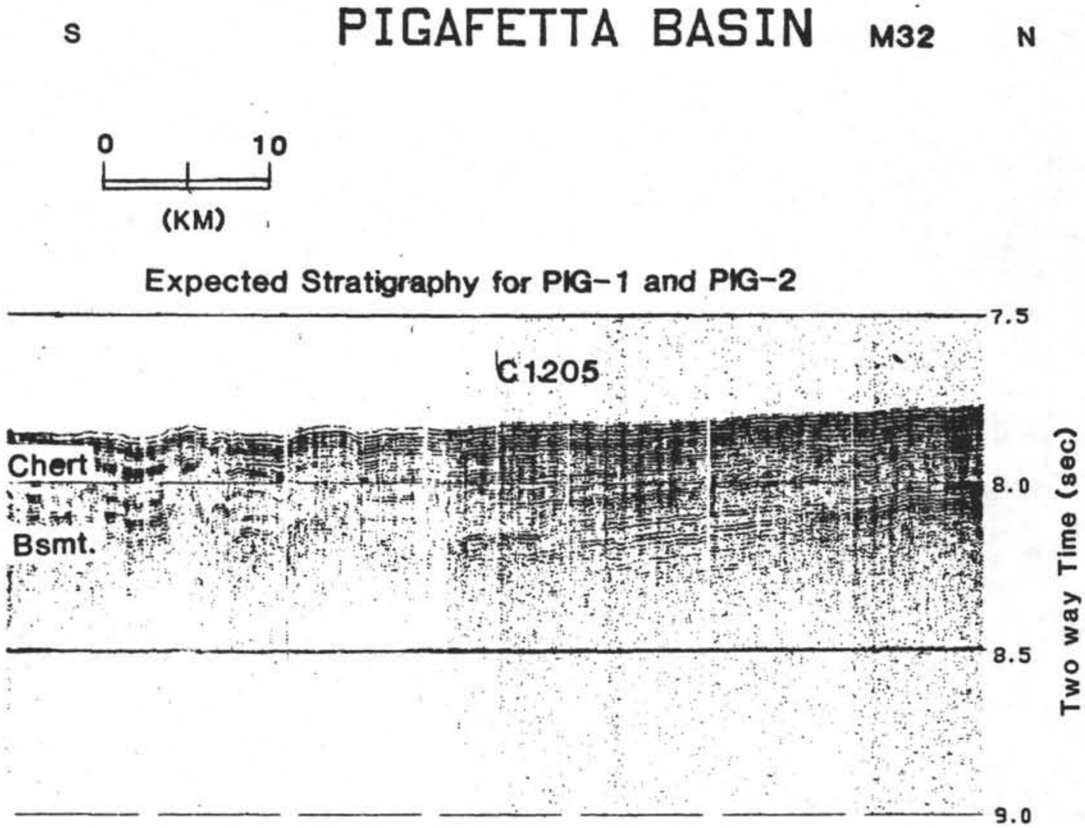


Figure 7. *Conrad* 1205 analog seismic profile characteristic of northwestern Pigafetta Basin. This location on M32 to M33 shows about 300-400 m of very reflective sediment overlying basement ("Bsmt.") at 8.2 s. This is very similar to the seismic profiles at DSDP Site 307.

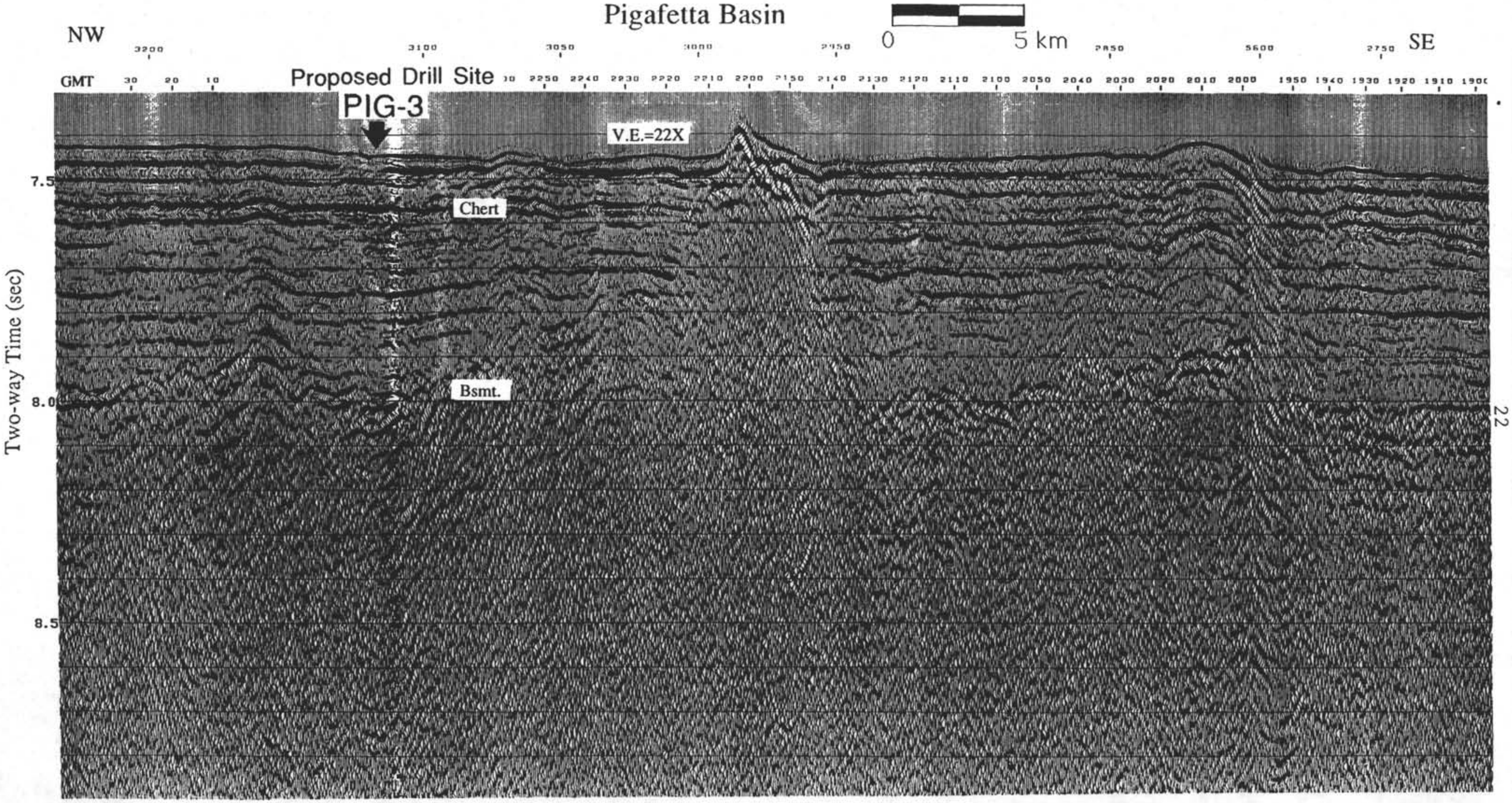


Figure 8. PIG-3 site location on ***Fred Moore*** 35-12 multichannel seismic profile. The deepest event, a series of hyperbolic reflections forming a rough, unconformable horizon is identified as basement ("Bsmt."). This deepest reflection is difficult to trace as far as the flat-lying "Bsmt." reflection located by sonobuoy 22.

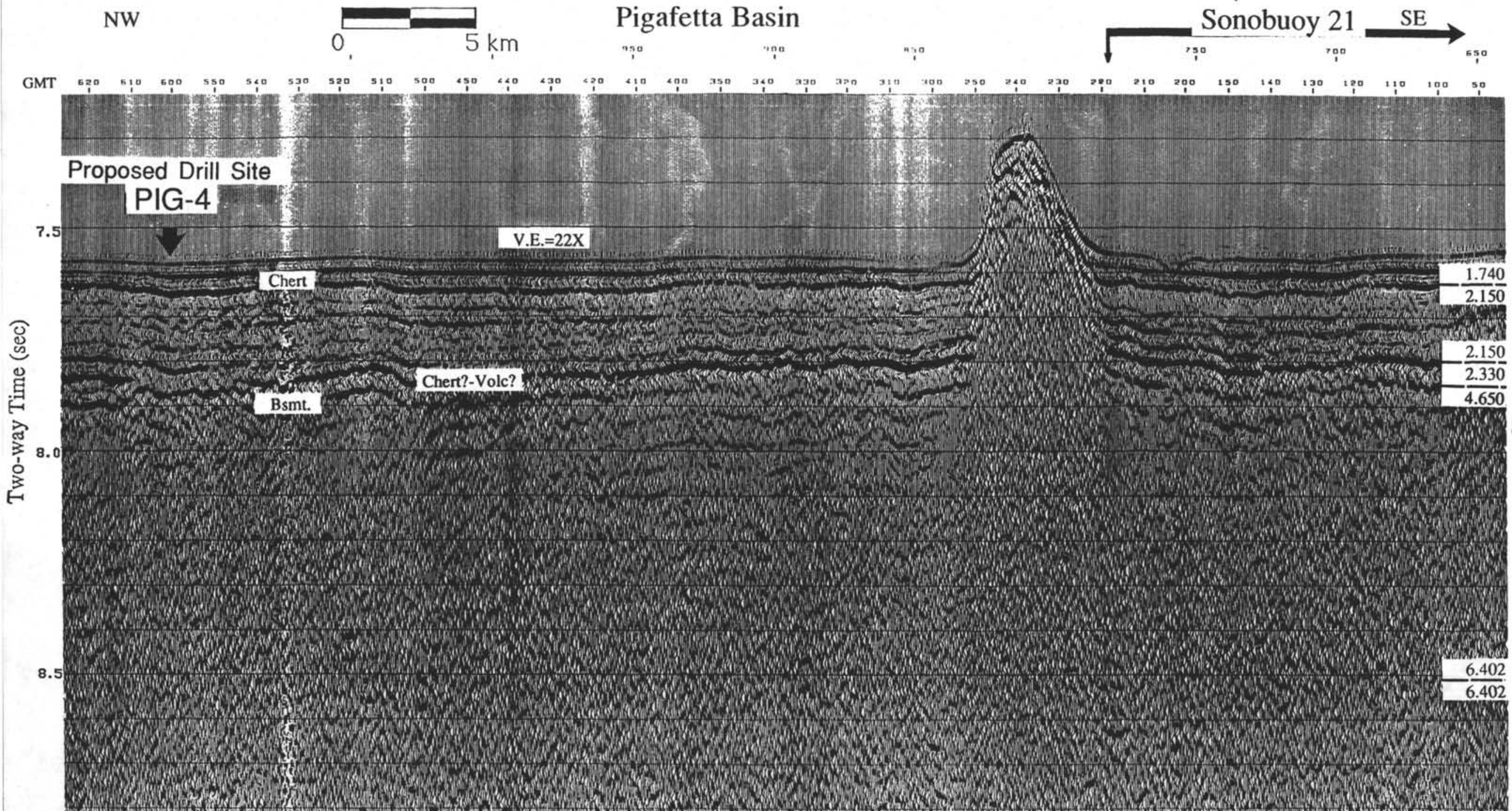


Figure 9. PIG-4 site location and sonobuoy 21 (SB-21) location on *Fred Moore* 35-12 multichannel seismic profile. SB-21 velocity solutions (km/s) are superimposed, with velocities characteristic of oceanic crust beginning at 0.33 s below seafloor corresponding to the reflection just below the "Chert?-Volc?" horizon and identified as basement at PIG-4.

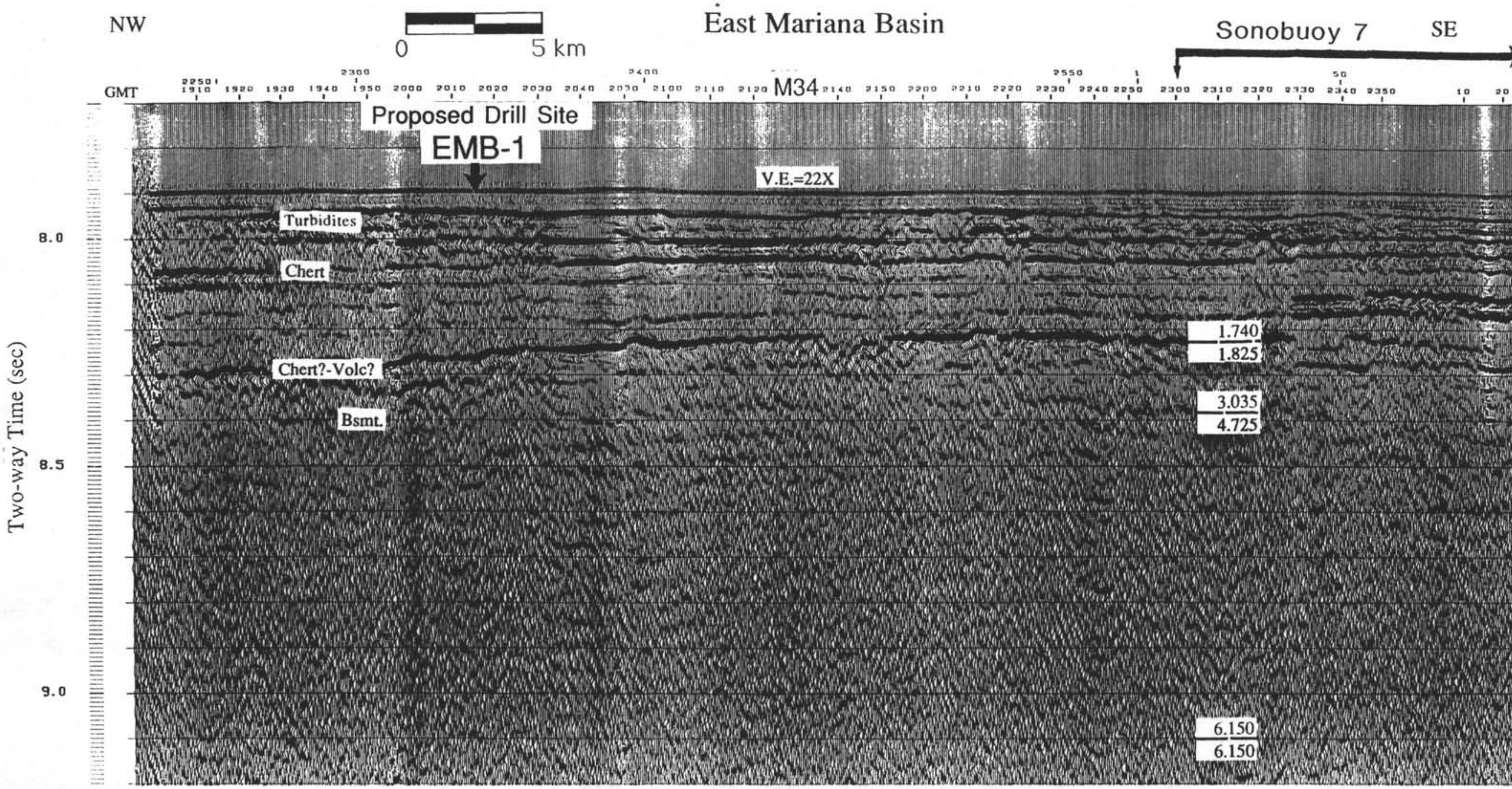


Figure 10. EMB-1 site location and sonobuoy 7 (SB-7) on *Fred Moore* 35-12 multichannel seismic profile. SB-7 velocity solutions (km/s) are superimposed, with velocities characteristic of oceanic crust beginning at 0.491 s below seafloor, below the deepest high-amplitude reflection at ~0.3-0.4 s and at approximately the same depth as a rough, discontinuous and unconformable reflection identified as basement ("Bsmt.") at site EMB-1. Note layer 2 thickness of 0.74 s (2.0 km).

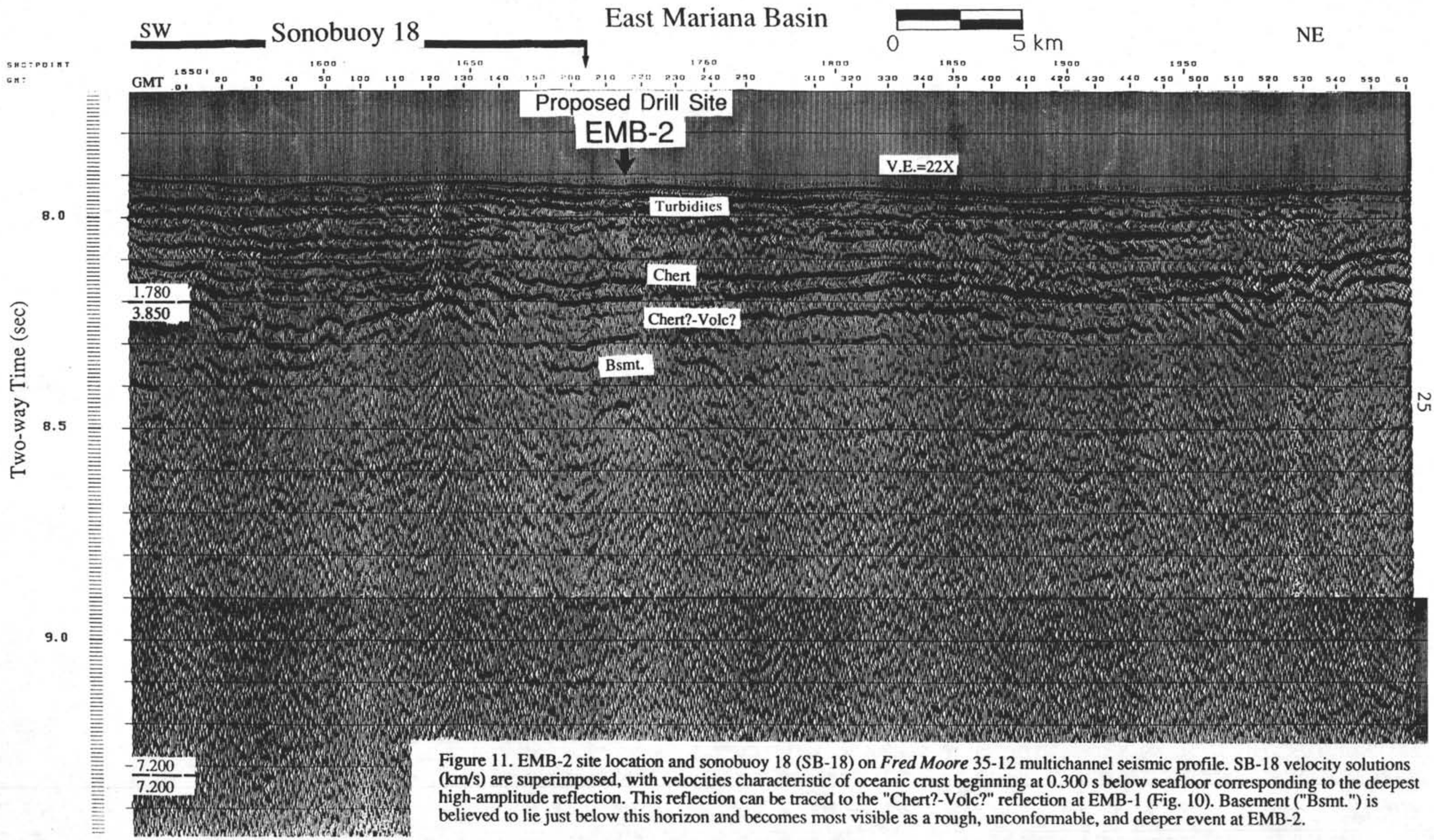


Figure 11. EMB-2 site location and sonobuoy 18 (SB-18) on *Fred Moore* 35-12 multichannel seismic profile. SB-18 velocity solutions (km/s) are superimposed, with velocities characteristic of oceanic crust beginning at 0.300 s below seafloor corresponding to the deepest high-amplitude reflection. This reflection can be traced to the "Chert?-Volc?" reflection at EMB-1 (Fig. 10). Basement ("Bsmt.") is believed to lie just below this horizon and becomes most visible as a rough, unconformable, and deeper event at EMB-2.

SITE: PIG-1 PRIORITY: 1

POSITION: 22°30'N, 151°30'E

WATER DEPTH: 5885 m SEDIMENT THICKNESS: 345 m

PROPOSED DRILLING PROGRAM: Rotary coring 100 m into basement, with reentry cone and casing of upper 200 m of hole.

SEISMIC RECORD: *Conrad* 1205 SCS; NORDA aeromagnetics; shipborne magnetics (Handschumacher); *Suroit* MCS lines (Aug-Sept 1989)

HEAT FLOW: Yes WATER SAMPLER: Yes

LOGGING: Standard Schlumberger logging, borehole televiewer or formation microscanner, magnetometer/susceptibility, one or more packer measurements, possibly VSP.

OBJECTIVES: (1) Age calibration of Late Jurassic magnetic anomalies, (2) Characterization of Jurassic sediments and the paleoenvironment of the "superocean," (3) Geochemical reference and physical properties of sediments and crust.

NATURE OF SEDIMENT/ROCKS ANTICIPATED: Pelagic clay, chert, volcaniclastics, nannofossil chalk, limestone, basalt basement.

SITE: PIG-2

PRIORITY: Alternate to PIG-1

POSITION: 20°18'N, 152°35'E

WATER DEPTH: 5885 m

SEDIMENT THICKNESS: 345 m

PROPOSED DRILLING PROGRAM: Rotary coring 100 m into basement, with reentry cone and casing of upper 200 m of hole.

SEISMIC RECORD: *Conrad* 1205 SCS; NORDA aeromagnetics; shipborne magnetics (Handschumacher); *Suroit* MCS lines (Aug-Sept 1989)

HEAT FLOW: Yes

WATER SAMPLER: Yes

LOGGING: Standard Schlumberger logging, borehole televiewer or formation microscanner, magnetometer/susceptibility, one or more packer measurements, possibly VSP.

OBJECTIVES: (1) Age calibration of Late Jurassic magnetic anomalies, (2) Characterization of Jurassic sediments and the paleoenvironment of the "superocean," (3) Geochemical reference and physical properties of sediments and crust.

NATURE OF SEDIMENT/ROCKS ANTICIPATED: Pelagic clay, chert, volcaniclastics, nannofossil chalk, limestone, basalt basement.

SITE: PIG-3 PRIORITY: 1

POSITION: 19°30'N, 155°56'E

WATER DEPTH: 5580 m SEDIMENT THICKNESS: 701 m

PROPOSED DRILLING PROGRAM: Rotary coring 50 m into basement.

SEISMIC RECORD: *Fred Moore* 35-12 96-channel seismic line 10 2330Z, 24 Nov 1987; NORDA aeromagnetics, shipborne magnetics (Handschumacher)

HEAT FLOW: Yes WATER SAMPLER: Yes

LOGGING: Standard Schlumberger logging, magnetometer/susceptibility, possibly VSP.

OBJECTIVES: (1) Age calibration and characterization of the Jurassic Quiet Zone, (2) Characterization of Jurassic sediments and the paleoenvironment of the "superocean," (3) Geochemical reference and physical properties of sediments and crust.

NATURE OF SEDIMENT/ROCKS ANTICIPATED: Thin (<40 m) turbidites and pelagic clay overlying shallow Late Cretaceous chert, pelagic clay/chert and volcaniclastics, nannofossil chalk/limestone/chert, basalt basement

SITE: PIG-4 PRIORITY: 1

POSITION: 17°29'N, 158°44'E

WATER DEPTH: 5680 m SEDIMENT THICKNESS: 421 m

PROPOSED DRILLING PROGRAM: Rotary coring 50 m into basement.

SEISMIC RECORD: *Fred Moore* 35-12 96-channel seismic line 10 0600Z, 23 Nov 1987; NORDA aeromagnetics, shipborne magnetics (Handschumacher)

HEAT FLOW: No WATER SAMPLER: No

LOGGING: Standard Schlumberger logging; magnetometer/susceptibility, possibly VSP.

OBJECTIVES: (1) Age calibration and characterization of the original Pacific microplate, (2) Characterization of Jurassic sediments and the paleoenvironment of the "superocean," (3) Geochemical reference and physical properties of sediments and crust, (4) Characterization of middle Cretaceous volcanic complex.

NATURE OF SEDIMENT/ROCKS ANTICIPATED: Thin (<40 m) turbidites and pelagic clay overlying shallow Late Cretaceous chert, pelagic clay/chert and volcaniclastics, nannofossil chalk/limestone/chert, basalt basement

SITE: EMB-1 PRIORITY: 2 (alternate for PIG-3)

POSITION: 13°39'N, 152°19'E

WATER DEPTH: 5920 m SEDIMENT THICKNESS: 500 m

PROPOSED DRILLING PROGRAM: Rotary coring 100 m into basement.

SEISMIC RECORD: Fred Moore 35-12 96-channel seismic line 3 2015Z 12 Nov 1987; shipborne magnetics, K. Tamaki and *Vema* 3506

HEAT FLOW: No WATER SAMPLER: No

LOGGING: Standard Schlumberger logging; magnetometer/susceptibility

OBJECTIVES: (1) Age calibration and characterization of Middle Jurassic magnetic anomalies, (2) Characterization of Jurassic sediments and the paleoenvironment of the "superocean," (3) Geochemical reference and physical properties of sediments and crust.

NATURE OF SEDIMENT/ROCKS ANTICIPATED: Turbidites, pelagic clay, chert, nannofossil chalk, limestone, volcaniclastics, mid-Cretaceous volcanics (sills/flows?), basalt basement

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Sedimentologist:	TO BE NAMED
Sedimentologist:	TO BE NAMED

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Chemistry Technician:	VALERIE CLARK Ocean Drilling Program 1000 Discovery Drive Texas A&M Univ. Research Park College Station, TX 77843
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Marine Technician:	"KURO" KUROKI Ocean Drilling Program 1000 Discovery Drive Texas A&M Univ. Research Park College Station, TX 77843
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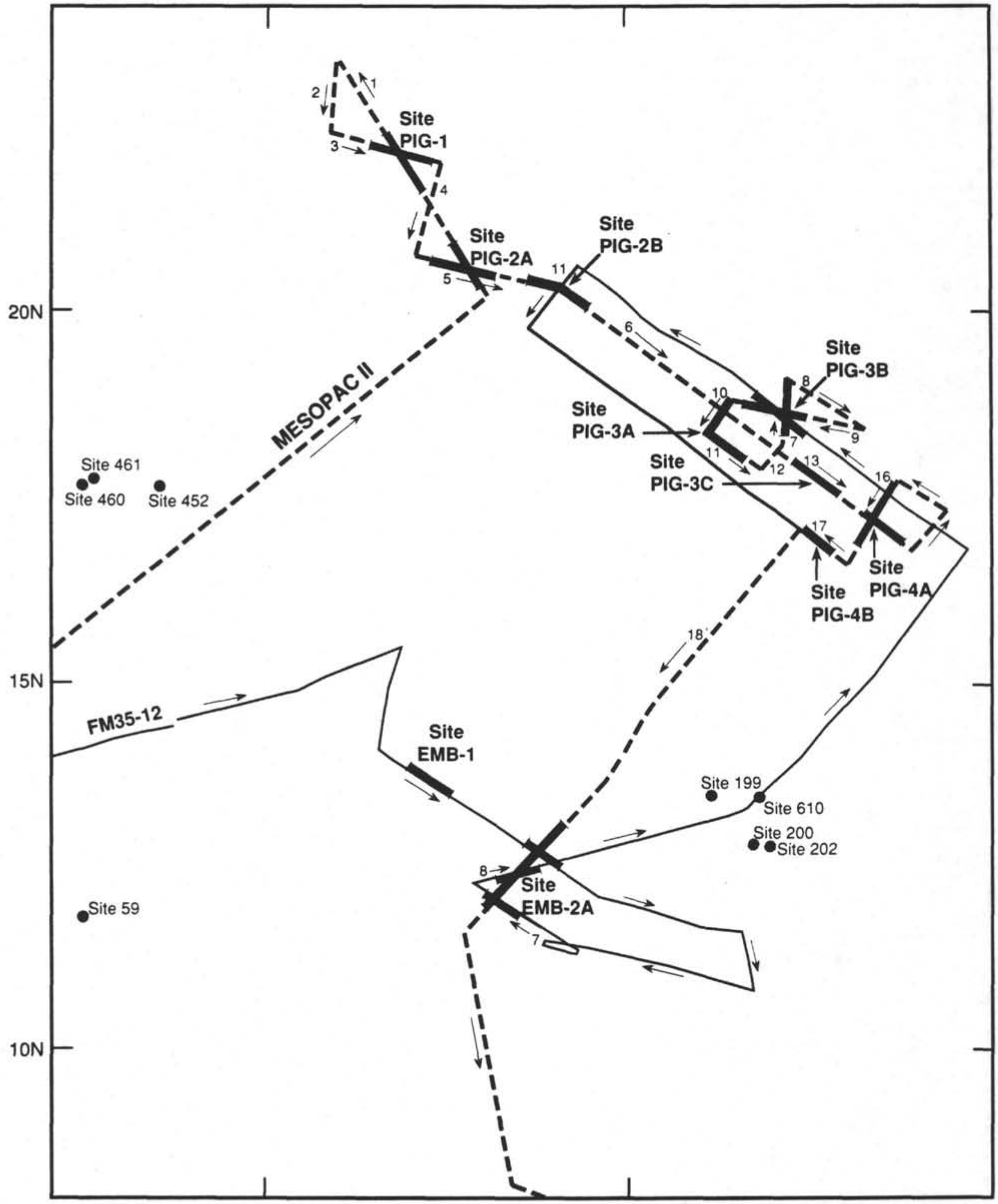
Marine Technician:	MICHAEL MOORE Ocean Drilling Program 1000 Discovery Drive Texas A&M Univ. Research Park College Station, TX 77843
Marine Technician:	JOAN PERRY Ocean Drilling Program 1000 Discovery Drive Texas A&M Univ. Research Park College Station, TX 77843
Marine Technician:	TO BE NAMED Ocean Drilling Program 1000 Discovery Drive Texas A&M Univ. Research Park College Station, TX 77843

TO:	Leg 129 shipboard party, panel chairs, and other interested persons	DATE:	2 November 1989
FROM:	Andy Fisher a.f.		
RE:	addendum to Leg 129 Prospectus		

Please find enclosed an addendum to the Leg 129 Prospectus which includes: (1) an index map showing the ship track during the recent *Suroit* survey (MESOPAC II) and revised site locations; (2) revised site sheets; (3) copies of portions of the monitor records from the *Suroit*; and (4) a final staffing list for the leg. The primary sites are now PIG-1, PIG-3A, PIG-4B, and EMB-2A. The plan is to drill single bit holes first at PIG-1 and PIG-3A and then decide which of these will be the reentry site. Depending on the results at these first two sites, the third (and probably final) site will be either PIG-4B or EMB-2A. All other sites are listed as having secondary priority. The time estimates for operations are little changed from those listed in the Prospectus. We have crudely estimated the depth to basement at all sites based on tenuous basement picks and assumed depth/velocity relationships in the sediments; actual sediment thicknesses may well be quite different from those listed on the site sheets.

Ocean Drilling Program
Science Operations
Texas A&M University Research Park
1000 Discovery Drive
College Station, Texas 77840 USA
(409) 845-7209
Telex Number: 62760290 ODP TAMU


Site
PIG-1
Site
PIG-2A
Site
PIG-2B
Site
PIG-3B
Site
PIG-3A
Site
PIG-3C
Site
PIG-4A
Site
PIG-4B
MESOPAC II
FM35-12
Site
EMB-1
Site
EMB-2A
Site 461
Site 460
Site 452
Site 199
Site 610
Site 200
Site 202
Site 59
20N
15N
10N
150E
155E

SITE: PIG-1 PRIORITY: 1

POSITION: 21°56.69'N, 152°20.8'E

WATER DEPTH: 5682 m SEDIMENT THICKNESS: 650 m

PROPOSED DRILLING PROGRAM: Rotary cored pilot hole through sediment section, 50 m into basement. Rotary cored reentry hole 100 m into basement, with casing of some or all of the sedimentary section (reentry will either be at PIG-1 or PIG3A).

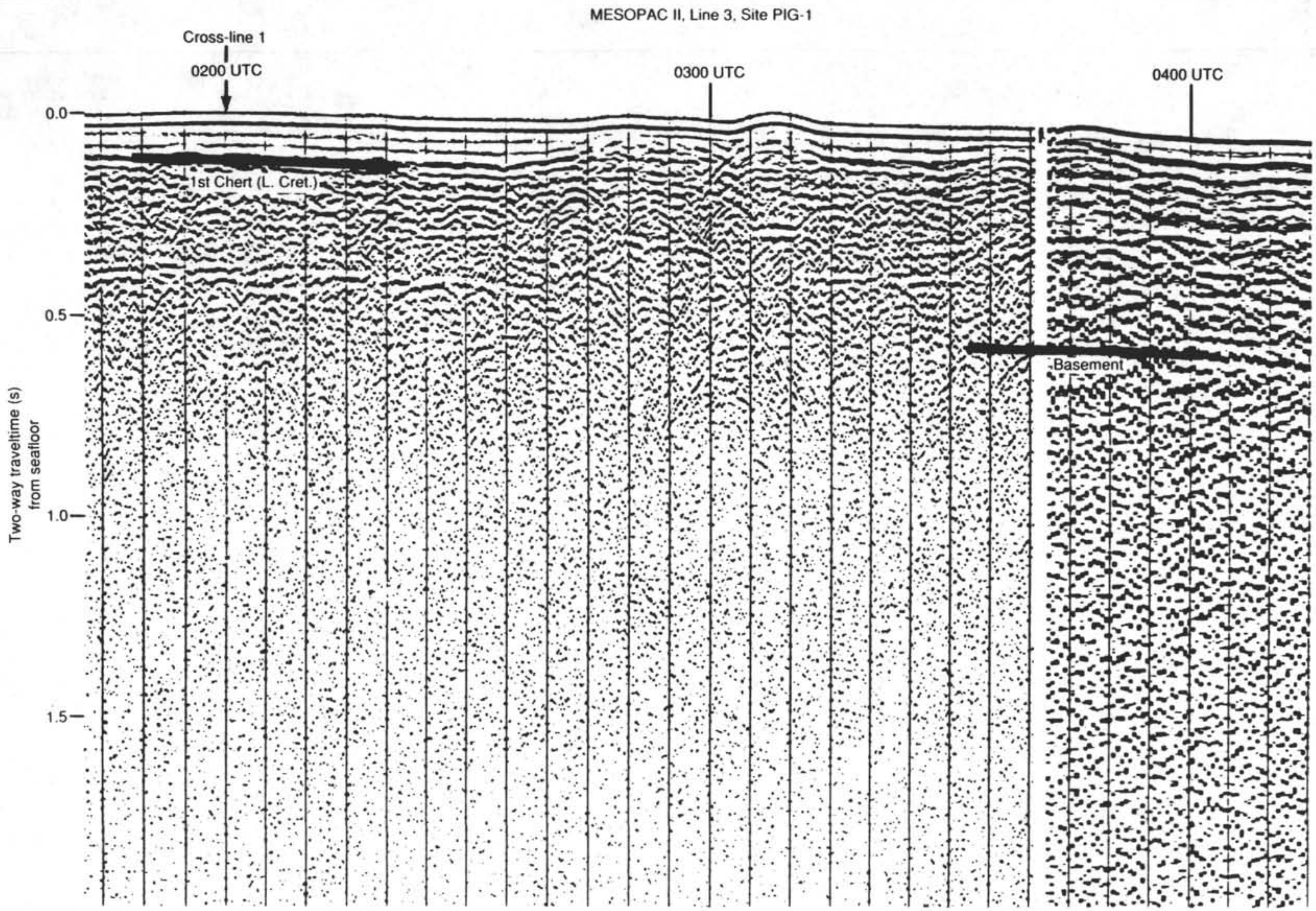
SEISMIC RECORD: *Suroit* MCS MESOPAC II, near intersection of Lines 1 and 3 (35 nmi SE to 25 nmi NW), @Line 3, 0740Z, 21 August 1989; *Conrad* 1205 SCS; NORDA aeromagnetics; shipborne magnetics (Handschumacher).

HEAT FLOW: Yes WATER SAMPLER: Yes

LOGGING: Standard Schlumberger logging, FMS, possibly VSP, also borehole televiewer or formation microscanner, magnetometer/susceptibility, and one or more packer measurements if reentry.

OBJECTIVES: (1) Age calibration of Late Jurassic magnetic anomalies, (2) Characterization of Jurassic sediments and the paleoenvironment of the "superocean," (3) Geochemical reference and physical properties of sediments and crust.

NATURE OF SEDIMENT/ROCKS ANTICIPATED: Pelagic clay, chert, volcaniclastics, nannofossil chalk, limestone, basalt basement.


MESOPAC II, Line 3, Site PIG-1
Cross-line 1
0200 UTC
0300 UTC
0400 UTC
1st Chert (L. Cret.)
Basement
Two-way traveltime (s) from seafloor
0.0
0.5
1.0
1.5

SITE: PIG-3A PRIORITY: 1

POSITION: 18°38.57'N, 156°21.66'E

WATER DEPTH: 5674 m SEDIMENT THICKNESS: 460 m

PROPOSED DRILLING PROGRAM: Rotary cored pilot hole through sediment section, 50 m into basement. Rotary cored reentry hole 100 m into basement, with casing of some or all of the sedimentary section (reentry will either be at PIG-1 or PIG3A).

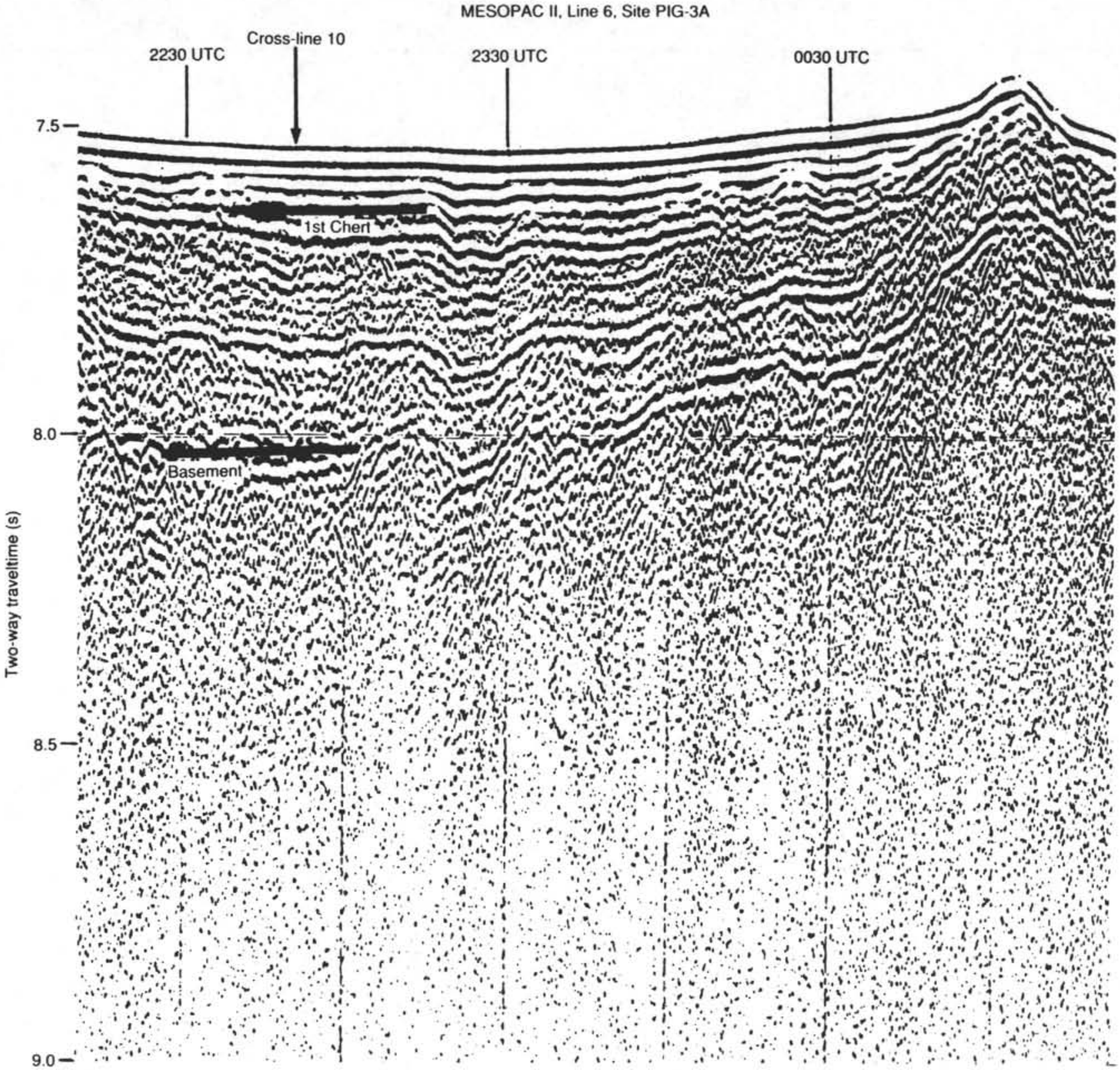
SEISMIC RECORD: *Suroit* MCS MESOPAC II, near intersection of Lines 6, 10, and 11 (anywhere along 10, 20 nmi SE of 10/11 intersection, 35 nmi NW or 20 nmi SE from 10/6 intersection), @Line 10, 0600Z, 26 August 1989; near *Fred Moore* 35-12 96-channel seismic line 10 2330Z, 24 Nov 1987; NORDA aeromagnetics, shipborne magnetics (Handschumacher).

HEAT FLOW: Yes WATER SAMPLER: Yes

LOGGING: Standard Schlumberger logging, FMS, possibly VSP, also borehole televiewer or formation microscanner, magnetometer/susceptibility, and one or more packer measurements if reentry.

OBJECTIVES: (1) Age calibration and characterization of the Jurassic Quiet Zone, (2) Characterization of Jurassic sediments and the paleoenvironment of the "superocean," (3) Geochemical reference and physical properties of sediments and crust.

NATURE OF SEDIMENT/ROCKS ANTICIPATED: Thin (<40 m) turbidites and pelagic clay overlying shallow Late Cretaceous chert, pelagic clay/chert and volcaniclastics, nannofossil chalk/limestone/chert, basalt basement.



MESOPAC II, Line 6, Site PIG-3A
Cross-line 10
2230 UTC
2330 UTC
0030 UTC
1st Chert
Basement
Two-way traveltime (s)
7.5
8.0
8.5
9.0

SITE: PIG-4B PRIORITY: 1

POSITION: 16°58.0'N, 157°33.20'E

WATER DEPTH: 5842 m SEDIMENT THICKNESS: 410 m

PROPOSED DRILLING PROGRAM: Rotary coring 50 m into basement.

SEISMIC RECORD: *Suroit* MCS MESOPAC II, Line 17 0630-1100Z, 29 August 1989; near *Fred Moore* 35-12 96-channel seismic line 10 0600Z, 23 Nov 1987; NORDA aeromagnetics, shipborne magnetics (Handschumacher).

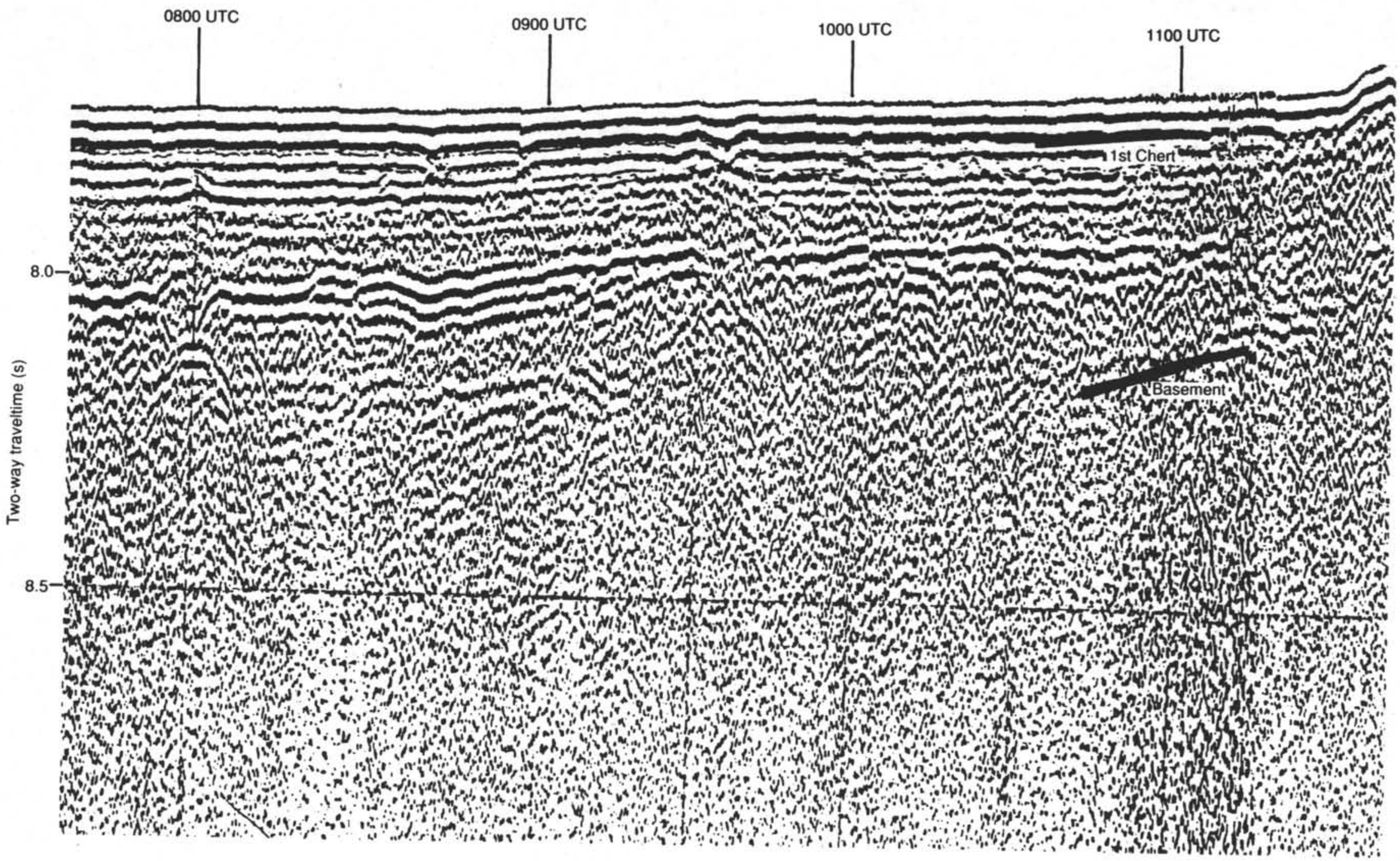
HEAT FLOW: No WATER SAMPLER: No

LOGGING: Standard Schlumberger logging, FMS, magnetometer/susceptibility, possibly VSP.

OBJECTIVES: (1) Age calibration and characterization of the original Pacific microplate, (2) Characterization of Jurassic sediments and the paleoenvironment of the "superocean," (3) Geochemical reference and physical properties of sediments and crust, (4) Characterization of middle Cretaceous volcanic complex.

NATURE OF SEDIMENT/ROCKS ANTICIPATED: Thin (<40 m) turbidites and pelagic clay overlying shallow Late Cretaceous chert, pelagic clay/chert and volcaniclastics, nannofossil chalk/limestone/chert, basalt basement.

MESOPAC II, Line 17, Site PIG-4B



SITE: EMB-2A PRIORITY: 1

POSITION: 12°10.67'N, 153°19.21'E

WATER DEPTH: 5968 m SEDIMENT THICKNESS: 550 m

PROPOSED DRILLING PROGRAM: Rotary coring 50 m into basement

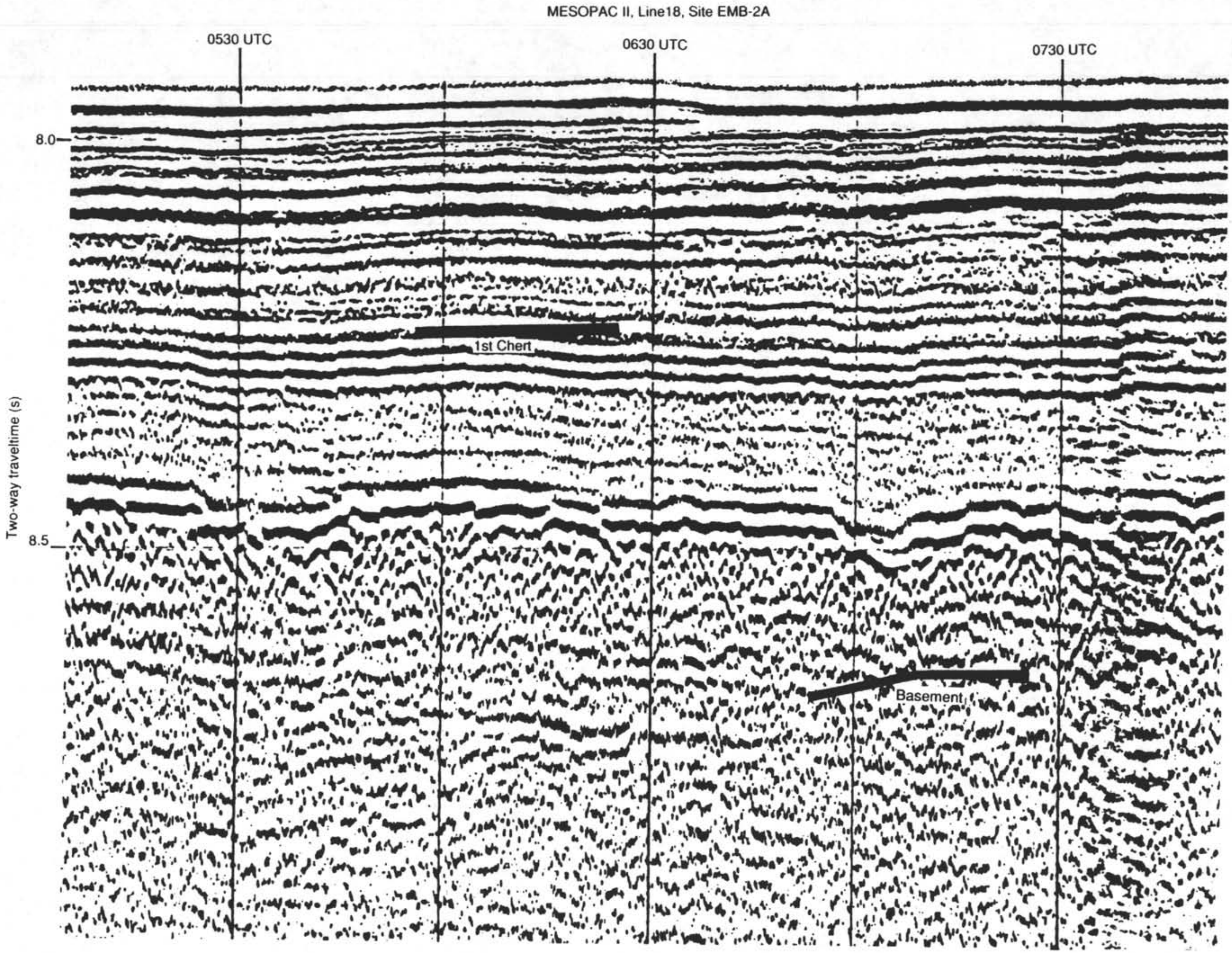
SEISMIC RECORD: *Suroit* MCS MESOPAC II, Line 18 between 1800Z 31 August 1989 and 1000Z 1 September 1989; or along *Fred Moore* 35-12 96-channel seismic line 8, between 0800Z and 1540Z 18 November 1987; or along *Fred Moore* 35-12 96-channel seismic line 7, between 2000Z 17 November 1987 and 0320Z 18 November 1987.

HEAT FLOW: No WATER SAMPLER: No

LOGGING: Standard Schlumberger logging, FMS, magnetometer/susceptibility, possibly VSP.

OBJECTIVES: (1) Age calibration and characterization of the Jurassic Quiet Zone, (2) Characterization of Jurassic sediments and the paleoenvironment of the "superocean," (3) Geochemical reference and physical properties of sediments and crust.

NATURE OF SEDIMENT/ROCKS ANTICIPATED: Turbidites, pelagic clay, chert, nannofossil chalk, limestone, volcaniclastics, mid-Cretaceous volcanics (sills/flows?), basalt basement.



MESOPAC II, Line18, Site EMB-2A
0530 UTC
0630 UTC
0730 UTC
8.0
8.5
Two-way traveltime (s)
1st Chert
Basement

SITE: PIG-2A PRIORITY: 2 (Alternate to PIG-1)

POSITION: 20°35'N, 152°45'E

WATER DEPTH: 5835-5865 m SEDIMENT THICKNESS: 520 m

PROPOSED DRILLING PROGRAM: Rotary cored pilot hole through sediment section, 50 m into basement. Rotary cored reentry hole 100 m into basement, with casing of some or all of the sedimentary section (reentry will either be at PIG-1 or PIG3A).

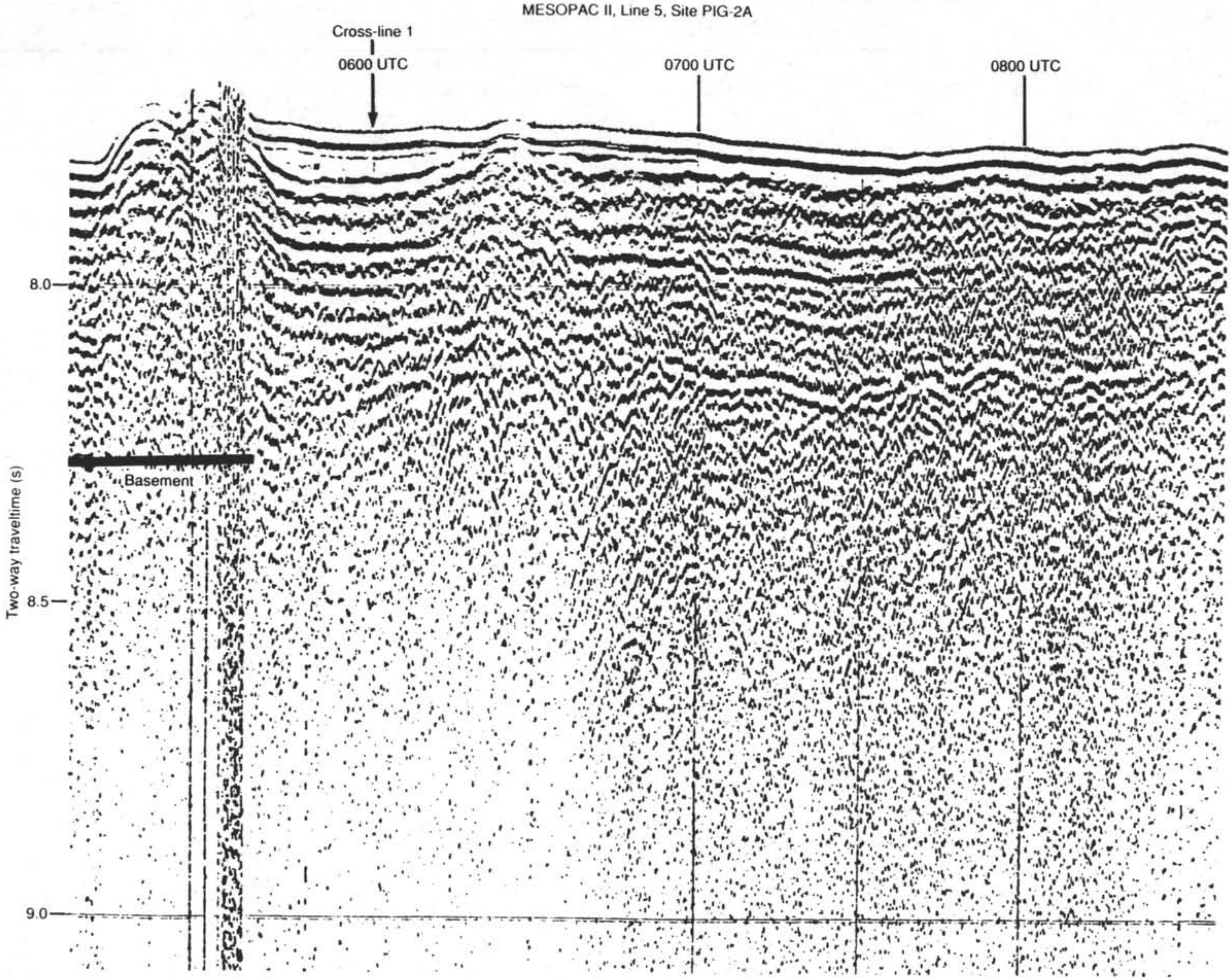
SEISMIC RECORD: *Suroit* MCS MESOPAC II, intersection of Lines 1 and 5, 22 nmi SE and 30 nmi NW; near *Conrad* 1205 SCS; NORDA aeromagnetics; shipborne magnetics (Handschumacher).

HEAT FLOW: Yes WATER SAMPLER: Yes

LOGGING: Standard Schlumberger logging, FMS, possibly VSP, also borehole televiewer or formation microscanner, magnetometer/susceptibility, and one or more packer measurements if reentry.

OBJECTIVES: (1) Age calibration of Late Jurassic magnetic anomalies, (2) Characterization of Jurassic sediments and the paleoenvironment of the "superocean," (3) Geochemical reference and physical properties of sediments and crust.

NATURE OF SEDIMENT/ROCKS ANTICIPATED: Pelagic clay, chert, volcaniclastics, nannofossil chalk, limestone, basalt basement.


MESOPAC II, Line 5, Site PIG-2A
Cross-line 1
0600 UTC
0700 UTC
0800 UTC
8.0
8.5
9.0
Two-way traveltime (s)
Basement

SITE: PIG-2B PRIORITY: 2 (Alternate to PIG-1)

POSITION: 20°16'N, 153°22'E

WATER DEPTH: 5865-5920 m SEDIMENT THICKNESS: 590 m

PROPOSED DRILLING PROGRAM: Rotary cored pilot hole through sediment section, 50 m into basement. Rotary cored reentry hole 100 m into basement, with casing of some or all of the sedimentary section (reentry will either be at PIG-1 or PIG3A).

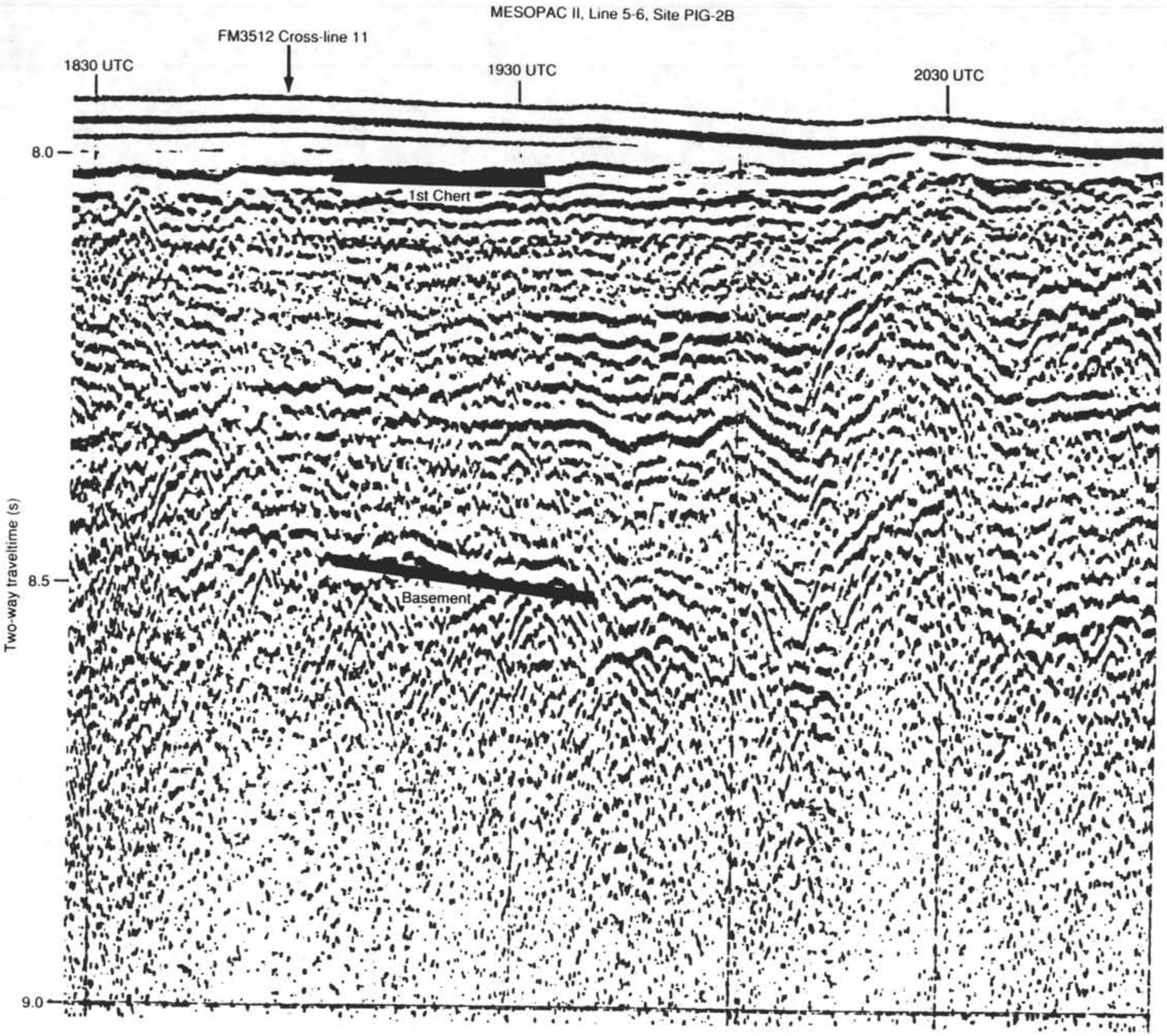
SEISMIC RECORD: intersection of *Suroit* MCS MESOPAC II, Line 5/6 and FM 3512 Line 11, 40 nmi NW and NE and 20 nmi SW and SE; near *Conrad* 1205 SCS; NORDA aeromagnetics; shipborne magnetics (Handschumacher).

HEAT FLOW: Yes WATER SAMPLER: Yes

LOGGING: Standard Schlumberger logging, FMS, possibly VSP, also borehole televiewer or formation microscanner, magnetometer/susceptibility, and one or more packer measurements if reentry.

OBJECTIVES: (1) Age calibration of Late Jurassic magnetic anomalies, (2) Characterization of Jurassic sediments and the paleoenvironment of the "superocean," (3) Geochemical reference and physical properties of sediments and crust.

NATURE OF SEDIMENT/ROCKS ANTICIPATED: Pelagic clay, chert, volcaniclastics, nannofossil chalk, limestone, basalt basement.



MESOPAC II, Line 5-6, Site PIG-2B
FM3512 Cross-line 11
1830 UTC
1930 UTC
2030 UTC
8.0
8.5
9.0
Two-way traveltime (s)
1st Chert
Basement

SITE: PIG-3B PRIORITY: 2 (Alternate for PIG-3A)

POSITION: 18°40'N, 157°9'E

WATER DEPTH: 5675-5700 m SEDIMENT THICKNESS: 440-590 m

PROPOSED DRILLING PROGRAM: Rotary cored pilot hole through sediment section, 50 m into basement. Rotary cored reentry hole 100 m into basement, with casing of some or all of the sedimentary section (reentry will either be at PIG-1 or PIG3A).

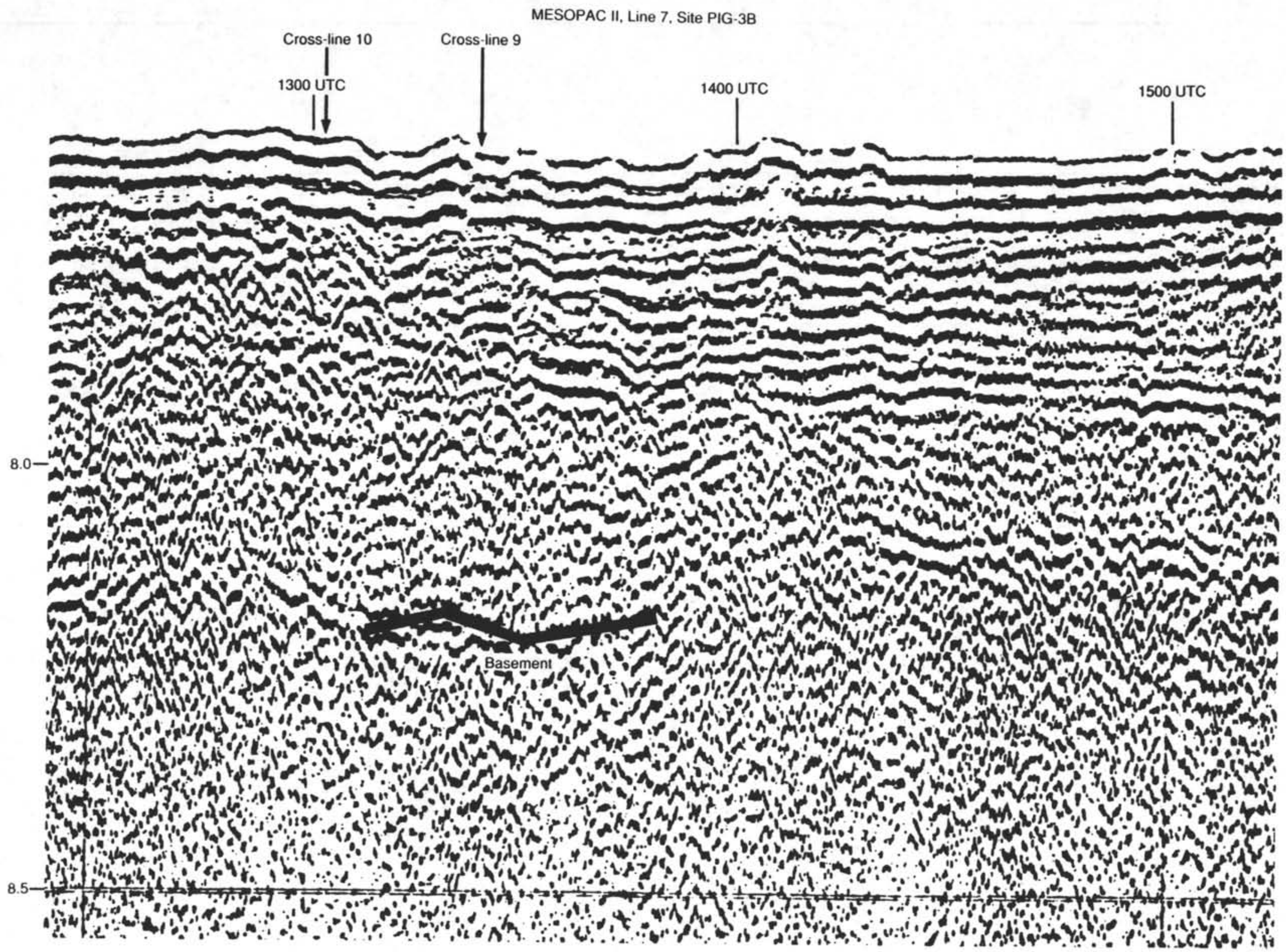
SEISMIC RECORD: anywhere along *Suroit* MCS MESOPAC II, Lines 7 or 9 or along FM 3512 from the intersecting of the three lines 20 nmi in all directions; NORDA aeromagnetics, shipborne magnetics (Handschumacher).

HEAT FLOW: Yes WATER SAMPLER: Yes

LOGGING: Standard Schlumberger logging, FMS, possibly VSP, also borehole televiewer or formation microscanner, magnetometer/susceptibility, and one or more packer measurements if reentry.

OBJECTIVES: (1) Age calibration and characterization of the Jurassic Quiet Zone, (2) Characterization of Jurassic sediments and the paleoenvironment of the "superocean," (3) Geochemical reference and physical properties of sediments and crust.

NATURE OF SEDIMENT/ROCKS ANTICIPATED: Thin (<40 m) turbidites and pelagic clay overlying shallow Late Cretaceous chert, pelagic clay/chert and volcaniclastics, nannofossil chalk/limestone/chert, basalt basement.


MESOPAC II, Line 7, Site PIG-3B
Cross-line 10
Cross-line 9
1300 UTC
1400 UTC
1500 UTC
8.0
8.5
Basement

SITE: PIG-3C PRIORITY: 2 (Alternate for PIG-3A)

POSITION: 17°46'N, 157°35'E

WATER DEPTH: 5735 m SEDIMENT THICKNESS: 440 m

PROPOSED DRILLING PROGRAM: Rotary cored pilot hole through sediment section, 50 m into basement. Rotary cored reentry hole 100 m into basement, with casing of some or all of the sedimentary section (reentry will either be at PIG-1 or PIG3A).

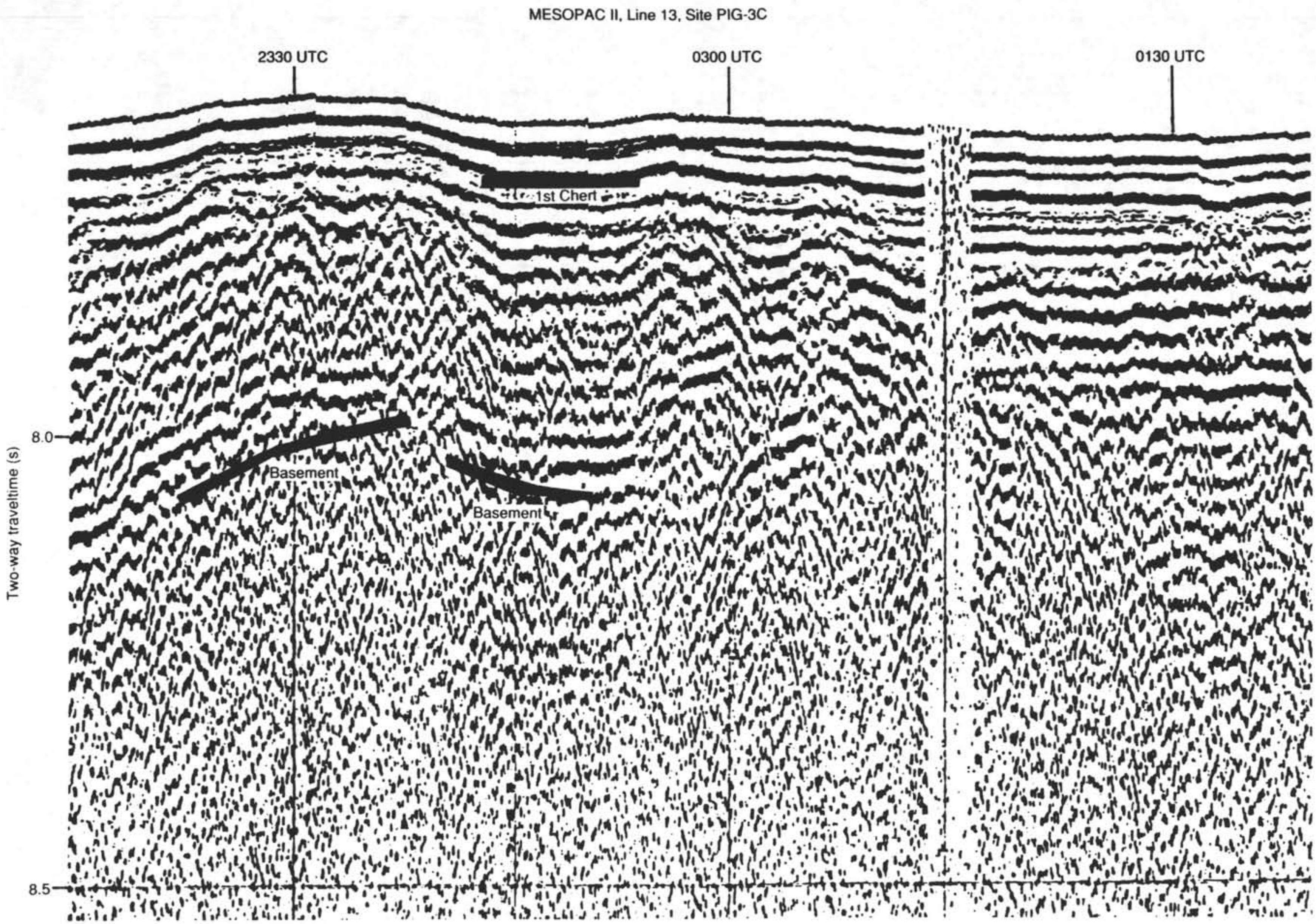
SEISMIC RECORD: anywhere along *Suroit* MCS MESOPAC II, Line 13 between 0000Z and 0800Z 29 August 1989; near *Fred Moore* 35-12 96-channel seismic line 10; NORDA aeromagnetics, shipborne magnetics (Handschumacher).

HEAT FLOW: Yes WATER SAMPLER: Yes

LOGGING: Standard Schlumberger logging, FMS, possibly VSP, also borehole televiewer or formation microscanner, magnetometer/susceptibility, and one or more packer measurements if reentry.

OBJECTIVES: (1) Age calibration and characterization of the Jurassic Quiet Zone, (2) Characterization of Jurassic sediments and the paleoenvironment of the "superocean," (3) Geochemical reference and physical properties of sediments and crust.

NATURE OF SEDIMENT/ROCKS ANTICIPATED: Thin (<40 m) turbidites and pelagic clay overlying shallow Late Cretaceous chert, pelagic clay/chert and volcaniclastics, nannofossil chalk/limestone/chert, basalt basement.


MESOPAC II, Line 13, Site PIG-3C
2330 UTC
0300 UTC
0130 UTC
1st Chert
Basement
Basement
8.0
8.5
Two-way traveltime (s)

SITE: PIG-4A PRIORITY: 2 (Alternate to PIG-4B)

POSITION: 17°9'N, 158°31'E

WATER DEPTH: 5750-5775 m SEDIMENT THICKNESS: 415 m

PROPOSED DRILLING PROGRAM: Rotary coring 50 m into basement.

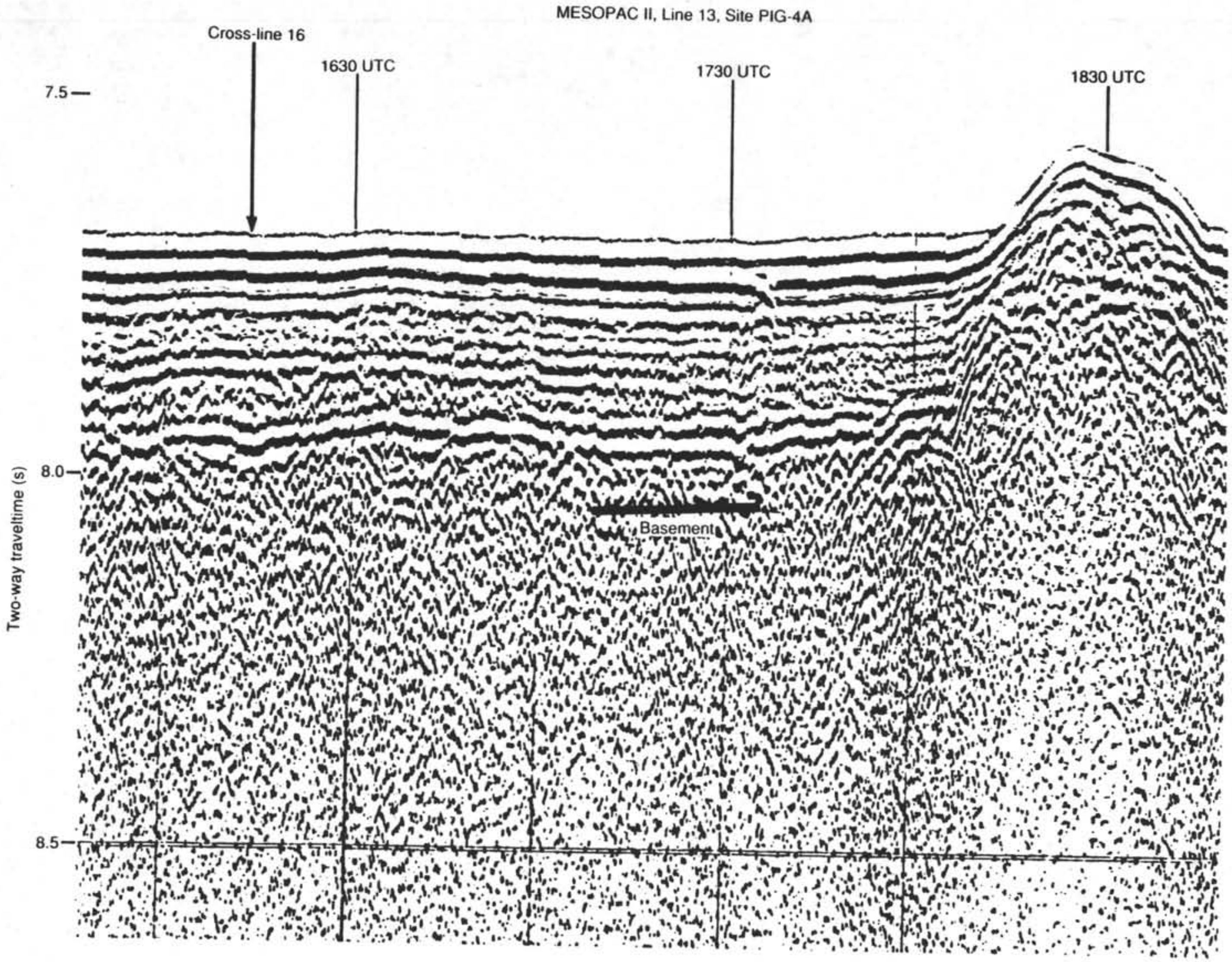
SEISMIC RECORD: anywhere along *Suroit* MCS MESOPAC II, Lines 13 and 16 from their intersection 35 nmi NE or SE, 20 nmi SW or 10 nmi NW; near *Fred Moore* 35-12 96-channel seismic line 10; NORDA aeromagnetics, shipborne magnetics (Handschumacher).

HEAT FLOW: No WATER SAMPLER: No

LOGGING: Standard Schlumberger logging, FMS, magnetometer/susceptibility, possibly VSP.

OBJECTIVES: (1) Age calibration and characterization of the original Pacific microplate, (2) Characterization of Jurassic sediments and the paleoenvironment of the "superocean," (3) Geochemical reference and physical properties of sediments and crust, (4) Characterization of middle Cretaceous volcanic complex.

NATURE OF SEDIMENT/ROCKS ANTICIPATED: Thin (<40 m) turbidites and pelagic clay overlying shallow Late Cretaceous chert, pelagic clay/chert and volcaniclastics, nannofossil chalk/limestone/chert, basalt basement.


MESOPAC II, Line 13, Site PIG-4A
Cross-line 16
1630 UTC
1730 UTC
1830 UTC
7.5
8.0
8.5
Two-way traveltime (s)
Basement

SITE: EMB-1 PRIORITY: 2 (alternate for EMB-2A)

POSITION: 13°39'N, 152°19'E

WATER DEPTH: 5925 m SEDIMENT THICKNESS: 500 m

PROPOSED DRILLING PROGRAM: Rotary coring 50 m into basement.

SEISMIC RECORD: Fred Moore 35-12 96-channel seismic line 3 1600Z to 2400Z 12 Nov 1987; shipborne magnetics, K. Tamaki and *Vema* 3506.

HEAT FLOW: No WATER SAMPLER: No

LOGGING: Standard Schlumberger logging, FMS, magnetometer/susceptibility, possibly VSP.

OBJECTIVES: (1) Age calibration and characterization of Middle Jurassic magnetic anomalies, (2) Characterization of Jurassic sediments and the paleoenvironment of the "superocean," (3) Geochemical reference and physical properties of sediments and crust.

NATURE OF SEDIMENT/ROCKS ANTICIPATED: Turbidites, pelagic clay, chert, nannofossil chalk, limestone, volcaniclastics, mid-Cretaceous volcanics (sills/flows?), basalt basement.

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