EXXON EXPLORATION COMPANY

New Biostratigraphic Subdivision and Paleoecology of the Paleocene Turrum Field Reservoir Section from Seven Gippsland Basin Wells, Australia (Unclassified)

Thomas D. Davies

TECHNOLOGY DEPARTMENT
GLOBAL STUDIES - GEOLOGICAL SERVICES DIVISION
BIOSTRATIGRAPHY SECTION
EEC.16A.BIO.95
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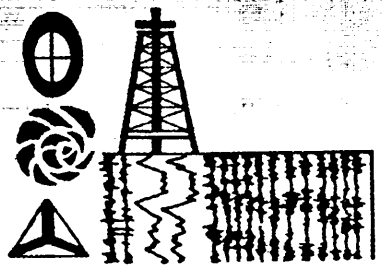

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EXXON EXPLORATION COMPANY
POST OFFICE BOX 2189 • HOUSTON, TEXAS 77252-2189

TECHNOLOGY DEPARTMENT
GLOBAL STUDIES/DATABASE DIVISION
BIOSTRATIGRAPHY

September 26, 1995

Russell G. Bellis
Esso Australia Limited
360 Elizabeth Street
Melbourne, Victoria
Australia 3000

Attention: *Adem Djakic/Brodie Thomson/Andy Zannetos*

Dear Russ:

Attached is an unclassified version of the report EEC.16A.BIO.95 by Thomas D. Davies entitled "New Biostratigraphic Subdivision and Paleoecology of the Paleocene Turrum Field Reservoir Section from Seven Gippsland Basin Wells, Australia". This report summarizes the results of palynostratigraphic and palynofacies analyses of greater than 300 core, sidewall core, and cutting samples studied to further subdivide the Paleocene *L. balmei* Zone. The Turrum biostratigraphy was successful in subdividing the Turrum reservoir section into nine biozones representing less than 10 my of time, where previously only one or two subdivisions had been made.

The success of this high-resolution biostratigraphic subdivision was due in part to 1) the incorporation of the marine dinocysts and biofacies, in addition to the traditional spores and pollen, 2) sequence stratigraphic based sample selection, and 3) EEC's state-of-the-art sample processing techniques. Also, the integration of the palynostratigraphic and palynofacies interpretations with the 3-D seismic and E-log data resulted in an improved model to constrain EAL's GEOSET model, added confidence to the current stratigraphic correlation, and helped to improve the sequence stratigraphic interpretations, facies models, and paleogeographic maps developed for the field. The new zonation relative to the seismic surfaces for the seven wells is summarized in Figures 1 and 2.

This report is unclassified, with all proprietary interpretations removed, so it can be distributed outside Exxon without further permission from EEC.

The Biostratigraphy Section appreciates this opportunity to work with you in ensuring the effective application of biostratigraphy to you project. If you have any comments or questions concerning this report, please contact Pete McLaughlin at 423-5988 or Tom Davies at 423-5992.

Yours truly,

B. A. Vining

by _____
P. P McLaughlin, Jr.

TDD
Attachments

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Thomas D. Davies

Global Studies/Geological Services Division
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August 1995

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Thomas D. Davies

SUMMARY

The Turrum biostratigraphy study was successful in subdividing the Turrum reservoir section into nine biozones representing less than 10 my of time, where previously only one or two subdivisions had been made. In addition to these nine Paleocene zones and subzones, one zone was differentiated above, and one below the reservoir interval. These zones are, in descending order: the Eocene Sz Zone (S referring to seal), the Paleocene Ra, Rb, Rc, Rd1, Rd2, Re1, Re2, Rf, Rg zones (R referring to reservoir), and Upper Cretaceous Ma Zone (M referring to Maastrichtian). This zonation is based on palynology and biofacies (sedimentary, dispersed organic material) analyses of greater than 300 core, sidewall core and cuttings samples from seven Turrum Field wells (i.e., Turrum-1, -2, -3, -4, Marlin-1, -2, and -4). Each of the new zones is identified in most of these wells and the biostratigraphic units can be traced across the area. The sequence stratigraphy and well log cross-section of Esso Australia Limited Collaborative Study provided a framework on which to build the new biostratigraphic zonation and select samples. In turn, integration of the new biostratigraphic and palynofacies interpretations with the 3-D seismic, well logs, and sequence stratigraphy resulted in an improved model to constrain EAL's GEOSET model and added confidence to the current stratigraphic correlation.

Although most of the "shales" associated with the reservoir sandstones, particularly above MFS "B", contain fossils indicative of marine influence, four intervals were identified that consistently contain rich and diverse marine assemblages. These intervals correlate with the marine flooding surfaces associated with MFS "E" SB, Near Top L-200, MFS "B" SB, and the 450 Marker, and enhanced the facies models and paleogeographic maps developed for the field. Also, palynology and palynofacies analyses provided information for paleoclimatic interpretation. For example, floral evidence that the climate was humid and mild during deposition of the uppermost (L-100 sandstone) and lower (L-500 sandstone) sections of the reservoir, appears to correlate with more extensive, laterally continuous reservoir sandstones.

Biostratigraphic results demonstrate that physical surface MFS "M" occurs within Palynozone Ra, Blue Grey SB is at or about 15 m above the top of Palynozone Rb, and Bottle Green SB occurs at or near the top of Zone Rc. MFS "E" typically falls within or near the top of Zone Rc, Near Top L-200 is generally just above the top of Zone Rd1, Naples Yellow occurs near the top of Zone Rd2, and MFS "B" occurs near the top of Palynozone Re, where present. The Pink SB is located generally near the top of Zone Rf and Zone Rg occurs near the 450 Marker surface. The top of Palynozone Ma appears beneath the Oriental Blue SB (Figures 1 and 2).

The new biostratigraphic subdivision, zone tops and ranges, and intervals of maximum marine incursions (based on dinoflagellate cyst diversity and type) for the seven wells are listed below. Questioned depths shown in parenthesis, e.g. (?2551 m), denotes possible shallowest depth of the zone top.

MARLIN-2

In sample 2231 m:	Zone Sz
2249-2274 m:	Zone Ra
2304-2313.9 m:	Indeterminate
2325-2386 m:	Zone Rc
2396-2455 m:	Indeterminate (Zone Rd1?)
?2466-2499 m:	Zone Rd2 (may be as high as ~2435 m; but no sample)
2522.4-2530 m:	Zone Re
(?2551) 2591-2676 m:	Zone Rf
2648.6-2651.6 m:	Indeterminate
?2700-2724 m:	Zone Rg
2755 m	Indeterminate
(?2786) 2867.7 m:	Zone Ma

Intervals of maximum flooding were recognized in samples 2356, 2368, 2522.4, and 2530 m. These are associated with the MFS "E" and MFS "B" sequence boundaries (Figure 3).

TURRUM-4

In samples 2275	Zone Sz
2290-2308 m:	Zone Ra
2320-2360 m:	Zone Rb
(?2365) 2375-2455 m:	Zone Rc
2470-2520 m :	Zone Rd1
2525-2565 m:	Zone Rd2
2580-2623 m:	Zone Re1
2630-35 m:	Zone Re2
2655-2725 m:	Zone Rf
2726 m:	Indeterminate

2750-2776.6 m:	Zone Rg

Intervals of maximum flooding occur in samples 2390, 2470, 2503.5, 2560, 2580, 2585, 2610 and 2630 m associated with the MFS "E" SB, Near Top L-200, and MFS "B" SB (Figure 3).

TURRUM-3

In sample 2034 m:	Zone Sz
(?2125) 2127-2140 m:	Zone Ra
2155 (-?2180) m:	Zone Rb
(?2194.9) 2215-2261.9 m:	Zone Rc
(?2280) 2305-2330 m :	Zone Rd1
2370 m:	Zone Rd2
2415-2450 m:	Zone Re1
2465 m:	Zone Re2
(?2475) 2485-2555 (-?2585) m:	Zone Rf
(?2614) 2645-2647 m:	Zone Rg
2700 (-?2810) m:	Zone Ma

Flooding intervals occur in samples 2215, 2240, 2280, 2305, 2325, 2415, 2614 and 2647 m, associated with the MFS "E" SB, Near Top L-200, and MFS "B" SB (Figure 3).

TURRUM-2

In samples 1986-2073.4 m:	Zone Sz
?2115.2 m:	Zone Ra
?2149.3 m:	Zone Rb
2197-2260.8 m:	Zone Rc
2292 m :	Zone Rd1
2332.5 m:	Indeterminate
2335-2370 m:	Zone Rd2
2385-2465.4 m:	Indeterminate
?(2400) 2465-70 m:	Zone Re (Subzones 1 and 2 not differentiated)
2480-2560 m:	Zone Rf
2588.2-2626 m:	Zone Rg
2647.1 m:	Indeterminate
2665.3 m:	Zone Ma

Intervals of maximum flooding occur in samples 2197, 2228, 2260.8, 2292, and 2465 m. These are associated with the MFS "E" SB, Near Top L-200, and MFS "B" SB (Figure 3).

MARLIN-4

In sample 2077.4 m	Zone Sz
Not Recognized	Zone Ra
Not Recognized	Zone Rb
?2185 m:	Zone Rc
2228 m:	Zone Rd1
2256.3 m:	Indeterminate
?2287.7 m:	Zone Rd2
?2348.7-2366.4 m:	Zone Re (Subzones not differentiated)
2394.1-2466.3 m:	Zone Rf
(?2496.2) 2514.5 m:	Zone Rg
(?2561.4) 2589.5 m:	Zone Ma

One maximum flooding interval was identified in this well at 2228 m. It is associated with the Near Top L-200 surface (Figure 3).

MARLIN-1

In samples 2014.6-2089.3 m:	Zone Sz
Not Recognized	Zone Ra
Not Recognized	Zone Rb
2167.6 m:	Zone Rb or lower
2206.6-2235 m:	Zone Rc
2250 m:	Zone Rd1
2280-2325 m:	Zone Rd2
(?2330) 2370-2390 m:	Zone Re (Zone not subdivided)
2395-2430 m:	Zone Rf
?2555-2575 m:	Zones Rg
2575.1 m:	Indeterminate
?2579.4 m:	Zones Ma

Intervals of maximum flooding were identified at 2206.6, 2214.3, 2250, and 2579.4, associated with MFS "E" SB, Near Top L-200, and the 450 Marker.

TURRUM-1

Not Present	Zone Ra
Not Present	Zone Rb
2085-2143 m:	Zone Rc
(?2151.8) 2168.9 m:	Zone Rd1
2184.1-2211.2 m:	Indeterminate
2234-2259 m:	Zone Rd2
2270.6-2274 m:	Indeterminate
Not Recognized	Zone Re
(?2295) 2365 m:	Zone Rf
2387-2443 m:	Indeterminate (possibly Zone Rg at 2405 and 2438 m)
2481.6 m:	Zone Ma

Two maximum flooding zone were identified at 2168.9 and 2252 m, associated with Near Top L-200 and MFS "B" SB.

TABLE OF CONTENTS

LIST OF FIGURES

INTRODUCTION

At the request of Esso Australia Limited (S.A. Reeckmann), core, sidewall core, and cuttings samples were examined from the Paleocene Turrum reservoir section of seven Gippsland Basin wells as part of the Turrum Re-Assessment Project. Samples were analyzed for biostratigraphic zonation, correlation, and age. The seven wells studied include Turrum-1, -2, -3, -4, Marlin-1, -2, and -4. The purposes of the project were: 1) to develop a new model to constrain the EAL's GEOSET model for the Paleocene Turrum clastic reservoir, using new high quality data and technology; 2) to gain more confidence in the current stratigraphic correlations, reservoir continuity, fluid contacts, and D.H.I.'s with better seismic resolution and more detailed, high-resolution biostratigraphic subdivisions; and 3) to more accurately estimate the distribution and quality of the reservoir rocks within the Turrum Field.

The objectives of biostratigraphy study were to determine whether it was possible to subdivide the Paleocene Lower *L. balmei* spore/pollen Zone, and if so, to develop a detailed biostratigraphic zonation through the reservoir interval where only one to two zones previously existed. Other goals were to provide paleoenvironmental interpretations to better constrain sequence stratigraphic interpretations, facies models, and paleogeographic maps, and give biostratigraphic age control for time-dependent issues, such as thermal maturation and migration, and give biostratigraphic age control for time-dependent issues, such as thermal maturation and migration.

As a result of the palynology and biofacies work, and the close working relationship with the Turrum team, the Turrum reservoir section was subdivided into nine zones and subzones versus the previous zonation of only one, to possibly two, zones. Numerous previous works by Pertridge, Stover, and others are reported in unpublished company reports. The previous biostratigraphic work in the region is sound, but it underutilized tools and methods now known to be useful for field and basin size applications. Although many of the forms used to define these new zones were recognized and reported from these wells by previous workers, the previous zonation emphasized the use of nonmarine spores and pollen grains. The success of this high-resolution biostratigraphic subdivision was due to a large part to the incorporation of both marine and non-marine palynomorphs, into the zonation, careful sequence stratigraphic based sample selection, and reprocessing with EEC's state-of-the-art sample processing technique. With this technique, there was an increase (~20%) in number of fossils recovered and we found several new, or previously unreported species, which allowed the current zonation of the reservoir.

Pre-existing microscope slides from seven wells were studied for palynology and paleoenvironments, including 180 core, sidewall core, and cuttings samples, as well as 130 reprocessed cuttings samples. The new Turrum field zonation and integrated correlation of the palynozones relative to the physical surfaces is shown in Figure 1 (back pocket). The occurrences of palynomorphs and organic matter for these wells are summarized in the foldout charts (Figures 2, 3, 4, 5, 6, 7, 8; following the references). Appendices A through G give the sample-by-sample description, zonation, and interpreted ages and appear at the end of the report.

At the time of most previous studies, the focus was primarily on the section above the Lower *L. balmei* zone. The high-resolution subdivision of the Lower *L. balmei* zone achieved in this project was possible because of the advantage of working closely with the Turrum Re-assessment Team, integrating the biostratigraphy with the sequence and seismic stratigraphy on an on-going basis, and adding the dimension of the marine fossils and palynofacies to the study. Success in subdividing the section also can be attributed to careful sample selection and reprocessing with EEC Houston's state-of-the-art sample processing techniques.

METHODOLOGY

For the Turrum Project, the initial part of the study focused on pre-existing, prepared microscope slides from about 180 cores and sidewall core samples from seven Turrum Field wells. The previous methods and dates of preparation of the samples from these wells varied considerably. Some of the samples were prepared in the 1960's (Marlin-1), while others were prepared in the 1990's (Turrum-4). In some of the wells, samples were scattered sparsely throughout the reservoir interval, whereas in others the samples were concentrated in only part of the section resulting in large sample gaps. Despite the variations and poor quality of some of the pre-existing slides, it was possible to subdivide the Turrum reservoir interval into two to six zones, utilizing marine fossil and palynofacies, together with the nonmarine pollen and spores, which are traditionally used in this area.

To test the subdivision, and to determine whether further subdivision was possible, approximately thirty closely spaced cuttings samples were chosen from both the Turrum-3 and 4 wells using the Collaborative Study's sequence stratigraphic framework. These samples were shipped to Houston and processed at the EEC Paleo Lab for palynology and biofacies analyses. From this detailed study, the section could be further subdivided. For example, the number of zones recognized in Turrum-3 increased from three to nine, and in Turrum-4 from six to nine. The impact of the newly selected samples and reprocessing is summarized below in Table 1. The number of zones recognized may have increased in Turrum-2, Marlin-1, Marlin-2, and Marlin-4 with increased sampling density.

Following these improvements, an additional 70 samples were selected from four other wells, re-processed, and studied. Samples from the entire reservoir interval were selected from Turrum-1 and Marlin-2, and from the sub-Naples Yellow section of the reservoir for Turrum-2 and Marlin-1, which is difficult to resolve with seismic data. Since the seismic resolution for Marlin-4 was suitable, samples were not reprocessed from this well. In total, approximately 500 palynology and kerogen microscope slides were prepared and examined from the six wells.

Table 1. Impact of New Samples and EEC Processing on Number of Zones Identified

Well (Compl. Date)	Pre-existing Sample (# of zones)	EEC Processing (# of zones)
Turrum-1 (1969)	3	5 (section missing)
Turrum-2 (1974)	5	8 (smpl. gap) *
Turrum-3 (1985)	3	9
Turrum-4 (1992)	6	9
Marlin-1 (1966)	2	5(7) *
Marlin-2 (1966)	4	5(7) (?miss. section /smpl. gap)
Marlin-4 (1973)	6	not re-sampled

Shading = could have done better
* = only re-sampled N. Yellow & below

Seven zones and two subzones are defined in the reservoir interval where only one or two zones existed previously. Many of the fossils used to define these zones were recognized and reported from these wells by previous workers. At the time of these studies the focus was primarily on the section above the Lower *L. balmei* zone. The high-resolution subdivision of the Lower *L. balmei* zone achieved in this project was possible because of the advantage of working closely with the Turrum Re-assessment Team, integrating the biostratigraphy with the sequence and seismic stratigraphy on an on-going basis, and adding the dimension of the marine fossils and palynofacies to the study. Success in subdividing the section also can be attributed to careful sample selection and reprocessing with EEC Houston's state-of-the-art sample processing techniques.

BIOSTRATIGRAPHIC ZONATION

In this section, nine biostratigraphic intervals are defined and characterized for the Turrum reservoir section. Each unit is defined as the stratigraphic interval between two distinctive biostratigraphic events. The ages for the Paleocene section given below, are only approximate ages, as little independent information has been obtained to correlate the Gippsland spore-pollen with the Exxon's Global Cycle Chart (Haq et al., 1987) using the marine dinoflagellates. Marine dinoflagellates from the Otway Basin (Cookson and Eisenack, 1965, 1967) and New Zealand (Wilson 1984, 1988) dated by planktonic foraminifera provide only limited calibration with the Cycle Chart. The relationship of these dinoflagellates with the NW European-based framework and their equivalencies with the Northern Hemisphere forms is unclear without further study.

Seven new zones are defined based on first and last downhole occurrences; two additional subzones are defined on palynofacies, peak occurrences, and relative abundance data. These new palynozones, integrated with the lithologic/seismic surfaces, are useful for constraining stratigraphic correlations across the field (Figure 1). Figure 1 illustrates the improvement in Turrum zonation and the zonal relationship to the physical surfaces. In addition to these nine reservoir zones and subzones, one zone was differentiated above, and one below the reservoir interval: the Eocene Sz Zone (S referring to seal), and Upper Cretaceous Ma Zone (M referring to Maastrichtian below the reservoir). Each zone is identified in most of the wells and the biostratigraphic units can be traced across the Turrum Field area.

Sz Biozone

Zone Sz is located just above the reservoir section. This zone is possibly correlative to the Upper *L. balmei* to Lower *M. diversus* zones described by Stover and Partridge (1973) and Stover and Evans (1973). Its age is interpreted to be Eocene-latest Paleocene?. This zone has been recorded from the Marlin-2, Turrum-4, Turrum -3, and Marlin-1 wells in the "shale"-prone section above the reservoir package and MFS "M" (Figure 1).

Ra Biozone

Zone Ra has been recognized in Marlin-2, Turrum-4, Turrum-3, and Turrum-2. Most of the L-100 sandstone belongs in this zone. Its top occurs about 5 to 20 m above this uppermost sandstone and contains the maximum flooding surface (MFS) "M" (Figure 1). This interval was not sampled in Marlin-4. Also, it was apparently removed by faulting in Marlin-1 and truncation in Turrum-1 (Figure 1). The age of this interval zone is interpreted to be latest Paleocene.

Rb Biozone

The top of Palynozone Rb is generally found at or about 15 m below the Blue Grey Sequence Boundary (SB) and has been recognized in Turrum-4, Turrum-3, and Turrum-2 (Figure 2). This section was not sampled in Marlin-2 or Marlin-4, and probably eroded in Turrum-1 and Marlin-1. The age of this zone is interpreted to be late Paleocene.

Rc Biozone

The Rc Zone top is associated with the Bottle Green SB, and the MFS "E" SB surface sits within this zone (Figure 1). This zone was recorded in Marlin-2, Turrum-4, Turrum-3, Turrum-2, Turrum-1, and Marlin-1 (Figure 1). This zone is tentatively assigned to the early part of the late Paleocene.

Rd Biozone

The Rd zone is interpreted to be late Danian (late part of the early Paleocene). Two acme subzones are recognized in this interval based primarily on biofacies and abundance data. Subzone Rd1 was recognized in Turrum-4, Turrum-3, Turrum-2, Marlin-4, Turrum-1 and Marlin-1 (Figure 1) at about the Near Top l-200 surface. The top of this interval appears to be depressed in Marlin-2, probably due to the lack of samples. Based on the E-log, the top of this zone may be as high as 2410 m. The Subzone Rd2 top is associated with Naples Yellow and was recorded in Marlin-2, Turrum-4, Turrum-3, Turrum-2, Marlin-4, and Marlin-1. In Turrum-1 it occurs about 30 m below Naples Yellow.

Re Biozone

The age suggested for the Re Zone is early Danian. Woody/coaly kerogen is common. Two subzones are differentiated for this interval. The top of Zone Re was identified just above MFS "B" SB in Marlin-1, Turrum-4, Turrum-3, Turrum-2, and Marlin-4, and about 25 m below the MFS "B" SB in Marlin-1(Figure 1). Subzone Re2 was recorded in Turrum-4 and Turrum-3.

Rf Biozone

The top of the Rf Zone is generally associated with the Pink SB (Figure 1). The age suggested for this zone is the early part of the early Danian to ?latest Maastrichtian.

This zone was recognized in this field in Turrum 4, Turrum-3, Turrum-2, Marlin-4, Turrum-1 and Marlin-1.

Rg Biozone

The top of Zone Rg, which is found near 450 Marker, was recorded in Marlin-2, Turrum-4, Turrum-3, Turrum-2, Marlin-4, and Marlin-1 and tentatively in Turrum-1 (Figure 1). The age of this interval is probable latest Maastrichtian in age.

Ma Biozone

Palynozone Ma first appear downhole beneath the reservoir, just below the Oriental Blue SB (Figure 1). Its age is interpreted as Late Maastrichtian.

RESULTS AND INTERPRETATIONS

MARLIN-2 WELL

Approximately forty core, sidewall core, and ditch cuttings samples were studied from this well in the section from 2231 to 2874.7 m. Relatively rich and diversified spore-pollen assemblages occur in most of the samples studied from this well, while marine dinocysts were found most frequently in the sections from 2325-2383 m and 2522.4-2530 m (Figure 2 and Appendix A). The palynological study of these samples resulted in the following palynologic zonation.

In sample 2231 m:	Zone Sz
2249-2274 m:	Zone Ra
2304-2313.9 m:	Indeterminate
2325-2386 m:	Zone Rc
2396-2455 m:	Indeterminate (Zone Rd1?)
?2466-2499 m:	Zone Rd2 (may be as high as ~2435 m; but no sample)
2522.4-2530 m:	Zone Re
(?2551) 2591-2676 m:	Zone Rf
2648.6-2651.6 m:	Indeterminate
?2700-2724 m:	Zone Rg
2755 m	Indeterminate
(?2786) 2867.7 m:	Zone Ma

Samples 2356, 2368 2522.4, 2530 m contain a relatively diverse assemblage of marine dinoflagellate cysts and are interpreted as intervals of maximum flooding. These intervals are associated with physical surfaces MFS "E" SB and the MFS "B" SB (Figure 1).

Zone Sz, assigned to the Eocene, was identified in sample 2231 m (Figures 1 and 2).

Zone Ra, interpreted to be latest Paleocene, was recorded in four samples from 2249-2274 m. Zone Rb was not recorded in this well. Samples were not available for study the interval just beneath the Blue Green horizon where this zone typically is found. Zone Rc (early late Paleocene) ranges from 2325 to 2386 m.

The interval from 2396 to 2455 m is indeterminate. Biofacies analyses suggest possible penetration of top of Zone Rd (early Paleocene). The four samples studied in the interval from 2466 to 2499 m (Figure 2) contain a moderately diverse spore-pollen flora, but are nearly barren of marine dinocysts. However, abundance data suggest that these samples probably are in the Rd2 zone. Zone Re, which is interpreted to be early Paleocene, was recorded in samples 2522.4 and 2530 m. Subzone Re2 was not differentiated in this well. Samples 2551 and 2582 m are tentatively assigned to Zone Rf based on abundance data and biofacies. The interval from 2591 to

2676 m is placed in Zone Rf (early Danian-?latest Maastrichtian). Zone Rg (probably latest Maastrichtian) is tentatively placed at 2700 and 2724 m. The floral assemblage in this interval is consistent with zone Rg. Sample 2755 m is very poorly fossiliferous and indeterminate for zonation.

Tentative Zone Ma (assigned to the Late Maastrichtian) was recorded at 2786 and 2861 m. The basal two samples from 2867.7 and 2874.7 m are assigned to Zone Ma (Figure 2; Appendix A).

TURRUM-4 WELL

Approximately forty-five sidewall core and ditch cuttings samples were studied from this well in the section from 2275 to 2776.6 m. The spore-pollen assemblage was relatively rich and diverse throughout most of the well. Marine dinocysts were common in most sample form the upper part of the well from 2630 and above (Figure 3 and Appendix B). The zonal tops are listed below, followed by a discussion of each interval.

In samples 2275	Zone Sz
2290-2308 m:	Zone Ra
2320-2360 m:	Zone Rb
(?2365) 2375-2455 m:	Zone Rc
2470-2520 m :	Zone Rd1
2525-2565 m:	Zone Rd2
2580-2623 m:	Zone Re1
2630-35 m:	Zone Re2
2655-2725 m:	Zone Rf
2726 m:	Indeterminate
2750-2776.6 m:	Zone Rg

Samples 2390, 2470, 2503.5, 2560, 2580, 2585, 2610, and 2630 m contain a relatively diverse assemblage of marine dinoflagellate cysts and are interpreted as intervals of maximum flooding. These are associated with physical surfaces MFS "E" SB, Near Top L-200 and the MFS "B" SB (Figure 1).

Zone Sz, assigned to the Eocene, was identified in sample 2275 m (Figure 3; Appendix B).

Zone Ra, interpreted to be latest Paleocene, was recorded in four samples from 2290 to 2308 m (Figure 3; Appendix B). Samples 2305 m and 2308 m contain a few *Pediastrum* spp. (colonial algal fossils), which indicate quiet, freshwater lake conditions at of near this interval. Zone Rb, assigned to the late Paleocene, was recorded in this well from 2320 to 2360 m. The zonation of sample 2365 m is not well established. At sample 2375 m the section is definitely in Zone Rc (early late Paleocene). The samples at 2450 m contains frequent *Pediastrum* (algal fossils) indicating freshwater lake conditions at of near this interval.

Zone Rd, interpreted to be early Paleocene, is subdivided into two subzones. Subzone Rd1 is recorded from 2470 to 2520 m. The six samples from 2525 to 2565 m (Figure 3; Appendix B) are assigned to Subzone Rd2. Zone Re is subdivided into subzones Rel and Re2. Subzone Rel was recognized in the six samples from 2580 and 2623 m. Zone Re2 was identified in this well at 2630 m, based on the presence of the dinocyst *Trithyrodinium* sp., together with the floral assemblage and biofacies present in Rel The interval from 2665 to 2720 m is placed in Zone Rf. Sidewall core sample 2726 m is very poorly fossiliferous and indeterminate for zonation. Zone Rg, which is probably latest Maastrichtian in age, is placed at 2750 and 2776.6 m.

Zone Ma was not recorded in this well.

TURRUM-3 WELL

Approximately 40 sidewall core and cutting samples were studies in the interval from 2125 to 2810 m. Marine dinoflagellate cysts were common to abundant in many samples in the upper part of the well from 2125 to 2470 m and in the intervals around 2614 and 2645-50 m.

In sample 2034 m:	Zone Sz
(?2125) 2127-2140 m:	Zone Ra
2155 (-?2180) m:	Zone Rb
(?2194.9) 2215-2261.9 m:	Zone Rc
(?2280) 2305-2330 m :	Zone Rd1
2370 m:	Zone Rd2
2415-2450 m:	Zone Rel
2465 m:	Zone Re2
(?2475) 2485-2555 (-?2585) m:	Zone Rf
(?2614) 2645-2647 m:	Zone Rg
2700 (-?2810) m:	Zone Ma

Samples 2215, 2440, 2280, 2305, 2325, 2415, 2614, and 2647 m are interpreted as intervals of maximum flooding based on diversity and type of dinocysts present. These are associated with physical surfaces MFS "E" SB, Near Top L-200, the MFS "B" SB, and 450 Marker (Figure 1).

Zone Sz was identified in sample 2034 m (Figures 1 and 4).

Zone Ra was recorded from 2125 to 2140 m (Figures 2 and 4; Appendix C). Zone Rb was recorded in this well in samples 2155 and 2157 m, and probably occurs in sample 2175 m (Figure 4; Appendix C). The zonation of the three samples from 2194.9 to 2210 m is not well established. However, abundance data at sample 2194.9 suggests possible penetration of Zone Rc. At sample 2215 m the section is definitely in Zone Rc. The assemblage associated with zone Rc continues through sample 2261.9 m.

Two subzones within Zone Rd are recognized. The sample at 2280 m is tentatively assigned to Subzone Rd1. Subzone Rd1 is recorded from 2305 to 2330 m. Sample 2365 m is probably still within this subzone. Samples 2370 m (Figure 4; Appendix C) is assigned to Subzone Rd2. It is poorly fossiliferous, but contains the assemblage characteristic of Subzone Rd2 in other parts of the field. Zone Re also is subdivided into two subzones. Subzone Re1 was recognized in the three samples from 2415 to 2450 m. Zone Re2 was identified in this well at 2465 m, based on the presence of the dinocyst dinoflagellate species sp, together with the floral assemblage and biofacies present in Re1 Sample 2475 m is tentatively assigned to Zone Rf, based on abundance data and biofacies consistent with the Rf zone. The interval from 2485 to 2550 m is placed in Zone Rf (Figure 4). The three samples in the interval from 2560 to 2585 m are tentatively placed in zone Rf. The zonal markers were not recovered, but the assemblage and biofacies are consistent with zone Rf (Figure 4). Samples 2614 and 2615 m are provisionally placed Zone Rg. The interval from 2645-50 m is assigned to Zone Rg.

Zone Ma was recorded in sample 2700 m. The three basal samples from 2710 to 2810 m are questionably included within Zone Ma.

TURRUM-2 WELL

Thirty sidewall core and cutting samples were studies in the interval from 1986 to 2665.5 m. Marine dinoflagellate cysts were common to abundant in many samples in the upper part of the well from 2115.2 to 2292 m and in the interval around 2465 m.

In samples 1986-2073.4 m:	Zone Sz
?2115.2 m:	Zone Ra
?2149.3 m:	Zone Rb
2197-2260.8 m:	Zone Rc
2292 m :	Zone Rd1
2332.5 m:	Indeterminate
2335-2370 m:	Zone Rd2
2385-2465.4 m:	Indeterminate
?(2400) 2465-70 m:	Zone Re (Subzones 1 and 2 not differentiated)
2480-2560 m:	Zone Rf
2588.2-2626 m:	Zone Rg
2647.1 m:	Indeterminate
2665.3 m:	Zone Ma

Samples 2197, 2228, 2260.8, 2292, and 2465 m are interpreted as intervals of maximum flooding based on diversity and type of dinocyts present. These are associated with physical surfaces MFS "E" SB, Near Top L-200, and the MFS "B" SB (Figure 1).

Zone Sz was first identified at 2073.4 m (Figures 1 and 5).

Zone Ra is provisionally assigned to sample 2115.2 m (Figures 2 and 5; Appendix D). The first downhole occurrence of an index fossil for this zone occurs in the SWC sample at 2149.3 m. Zone Rb is tentatively identified at 2149.3 (Figures 2 and 5). Zone Rc was identified in the three samples from 2197 and 2260.8 m (Figures 2 and 5). Kerogen slides, necessary for organic matter type analyses, were not available from the SWC's through this interval.

Two subzones within Zone Rd are recognized. Sample 2292 m is assigned to Subzone Rd1. Sample 2332.5 m is poorly fossiliferous and non diagnostic. Subzone Rd2 occurs in the interval from 2335 to 2370 m (Figure 5; Appendix D). The section from 2385 to 2465.4 m is indeterminate for zonation. However, sample 2400 m contains the assemblage of palynomorphs and kerogen generally associated with zone Re. Zone Re was not subdivided in this well, perhaps due partly to inadequate sampling density. The sample at 2465-70 m is assigned to Zone Re. The seven samples from 2480 to 2560 m are assigned to Zone Rf (Figure 5; Appendix D). Samples 2588.2 and 2623 m are placed Zone Rg. Sample 2647.1 m is nearly barren of palynomorphs and non diagnostic.

Zone Ma was recorded in sample 2665.3 m.

MARLIN-4 WELL

Approximately twenty-five previously prepare microscope slides were studied from core and sidewall core samples in the interval from 1807 to 2589.5 m. Marine dinoflagellate cysts are common to abundant in three of the samples from the Turrum reservoir (2228, 2348.7, and 2366.4 m). Terrestrially derived spores and pollen grains are relatively common in most of the samples.

In sample 2077.4 m	Zone Sz
Not Recognized	Zone Ra
Not Recognized	Zone Rb
?2185 m:	Zone Rc
2228 m:	Zone Rd1
2256.3 m:	Indeterminate
?2287.7 m:	Zone Rd2
?2348.7-2366.4 m:	Zone Re (Subzones not differentiated)
2394.1-2466.3 m:	Zone Rf
(?2496.2) 2514.5 m:	Zone Rg
(?2561.4) 2589.5 m:	Zone Ma

Sample 2228 m contains rich and diverse dinocyst assemblage and is interpreted to be an interval of maximum flooding. This interval is associated with the Near Top L-200 horizon (Figures 1 and 6).

Zone Sz was identified in sample 2077.4 m (Figure 6; Appendix E).

Zone Ra was not identified in this well. There is a large sample gap through the interval of the predicted tops for zones Ra, Rb, and Rc. The zonation of the sample from 2185.3 m is not well established, but the general assemblage and biofacies suggest that this sample may by in Zone Rc (Figures 2 and 6; Appendix E).

Two subzones are tentatively recognized within Zone Rd. Sample 2228 m is assigned to Subzone Rd1 and sample 2287.7 m is tentatively assigned to Subzone Rd2. Zone Re was not subdivided in this well. Samples 2348.7 and 2366.4 are tentatively included in Zone Re. The five samples from 2394.1 to 2466.3 m are assigned to Zone Rf (Figure 6; Appendix E).

Sample 2561.4 m is nearly barren of palynomorphs, but may be in the Ma zone. The sample at 2589.5 m is definitely placed in Zone Ma.

MARLIN-1 WELL

Approximately thirty core, sidewall core and cuttings samples were studied in the interval from 2014.6 to 2579.4 m. Marine dinoflagellate cysts are common in samples from the upper part of the Turrum reservoir section and again between 2230 and 2395 m. Terrestrially derived spores and pollen grains are relatively abundant throughout, but tend to become less prevalent in the Maastrichtian section beneath the reservoir section.

In samples 2014.6-2089.3 m:	Zone Sz
Not Recognized	Zone Ra
Not Recognized	Zone Rb
2167.6 m:	Zone Rb or lower
2206.6-2235 m:	Zone Rc
2250 m:	Zone Rd1
2280-2325 m:	Zone Rd2
(?2330) 2370-2390 m:	Zone Re (Zone not subdivided)
2395-2430 m:	Zone Rf
?2555-2575 m:	Zones Rg
2575.1 m:	Indeterminate
?2579.4 m:	Zones Ma

Sample 2206.6, 2214.3, 2250, and 2579.4 m contain a rich and diverse dinocyst assemblage and is interpreted to be an interval of maximum flooding. These interval are associated with MFS "E" SB, Near Top L-200, and 450 Marker (Figures 1 and 7).

Zone Sz is assigned to samples 2014.6 to 2089.3 m, based on occurrences of *Schizocolpus marlinensis* (an Eocene form) and *Proteacidites annularis* (base in Upper *L. balmei* zone according to Stover and Partridge, in Exxon reports at 2070.1 m (Figure 7; Appendix F).

Zones Ra and Rb were not identified in this well. With greater sampling density, it may have been possible to subdivide the section from 2089.3 to 2206.6 m. The interval from 2206.6 to 2235 m is placed in Zone Rc.

Two subzone are recognized within Zone Rd. Sample 2250 m is assigned to Subzone Rd1. Sample 2279.4 m is nearly barren of palynomorphs and non diagnostic. The interval from 2280 to 2325 m is designated to Zone Rd2 (Figure 7). Zone Re was not subdivided in this well. Samples 2330 and 2350 m are tentatively included in Zone Re. Zone Re is assigned to the interval from 2370 to 2390 m (Figure 7). Samples 2395 and 2425 m are assigned to Zone Rf (Figure 7; Appendix F). Samples 2550 and 2570 m are tentatively placed in Zone Rg. The assemblage recovered from sample 2255 m is consistent with Zone Rg. Samples 2575.1 and 2579 m are indeterminate.

Zone Ma may be penetrated at 2579.4 m.

TURRUM-1 WELL

Approximately thirty-five core, sidewall core and cuttings samples were studied in the interval from 1953.4 to 2481.6 m. Marine dinoflagellate cysts are relatively common in most samples above 2168.9 m. Terrestrially derived spores and pollen grains are relatively abundant throughout the studied section, but less prevalent in the Maastrichtian section beneath the reservoir section.

Not Present	Zone Ra
Not Present	Zone Rb
2085-2143 m:	Zone Rc
(?2151.8) 2168.9 m:	Zone Rd1
2184.1-2211.2 m:	Indeterminate
2234-2259 m:	Zone Rd2
2270.6-2274 m:	Indeterminate
Not Recognized	Zone Re
(?2295) 2365 m:	Zone Rf
2387-2443 m:	Indeterminate (possibly Zone Rg at 2405 and 2438 m)

2481.6 m: Zone Ma

Sample 2168.9 and 2252 m are interpreted to be an interval of maximum flooding, which are associated with Near Top L-200 and the 450 Marker (Figures 1 and 8).

The first Turrum reservoir zone to be recognized in this well is Zone Rc at 2085 m. This zone ranges from 2085 to 2143 m.

Two subzone are recognized within Zone Rd. Samples 2151.8 and 2158.9 m are tentatively assigned to Subzone Rd1 (Figures 1 and 8). At 2168.9 m the section is definitely in Subzone Rd1. The three samples in the interval from 2184.1 to 2211.2 m are poorly fossiliferous and the zonation is indeterminate. Subzone Rd2 is recognized at 2234 and 2252 m (Figure 8). Samples 2270 and 2271 m are indeterminate. The next zone recognized in this well was Zone Rf. The interval from 2295 to 2338 m is tentatively placed in this zone. Zone Rf is recognized in sample 2365 m (Figure 8; Appendix G).

The zonation of the section from 2387 to 2443 m is tenuous. Samples 2387, 2426, and 2435 m are nearly barren and indeterminate. The samples at 2405 and 2438 m contain a sparse palynomorph assemblage which suggests this sample may be in Zone Rg.

The basalmost sample studied at 2481.6 m is assigned to Zone Ma.

PALYNOSTRATIGRAPHIC CORRELATION

The palynostratigraphic correlation of the seven wells is illustrated in Figure 2. The palynomorph assemblages from these seven wells are remarkably consistent from well to well.

In relationship to the physical surface, the top of the Ra Zone occurs about 5 to 20 m above MFS "M" (Figure 1) and was recognized in Marlin-2, Turrum-4, -3, and -2. The top of the Rb zone occurs at or just below the Blue Grey SB. This zone was recognized in Turrum-4, -3, and -2; in Marlin-4 it is present, but appears to be depressed due to sampling gap. The top of Palynozone Rc occurs at or near the Bottle Green SB, which was recorded in all of the wells, except Marlin-4 (Figure 1).

The top of Subzone Rd1 typically occurs about 50 m below the MFS "E" SB and is usually associated with the Near Top L-200 surface. Subzone Rd1 was recorded in all of the well, except Marlin-2 (Figure 1). The top of Subzone Rd2 is generally found at about Naples Yellow. The top of this zone is depressed in Turrum-1, because of poorly fossiliferous samples in the projected target interval.

Top Subzone Re1 occurs at or about 25 m above MFS "B" SB and was recognized with certainly in Marlin-2, Turrum-4, -3, and -2. The top of Subzone Re2, where present, sits about 25 m

below MFS "B" SB. This subzone was only differentiated in Turrum-4 and -3. The top of the Rf Zone is located near Pink SB, which was recognized in all of the wells across the field. Zone Rg top sits close to 450 Marker and was identified with certainty in the four the wells, Turrum-4,-3. -2, and Marlin-4. The top of Palynozone Ma appears beneath the Oriental Blue SB at the base of the section (Figure 1).

PALEOECOLOGY

Results indicate that deposition of the reservoir interval of the Turrum Field area took place in a non-marine to marginal marine environment with periodic and short-lived marine floods. The middle and upper portions of the reservoir sequence appeared to have experienced more numerous and extensive flooding, whereas the basal part of the section, below the MFS "B" SB surface, contains fewer marine records. Although most of the shales associated with the reservoir sands, particularly above MFS "B" SB, contain some fossils indicative of marine influence, four horizons were identified that contain rich and diverse marine palynomorph assemblages. These occur at or about the MFS "E" SB, Near Top L-200, MFS "B" SB, and the 450 Marker. These flooding events were recognized at about the MFS "E" SB horizon in Marlin-1, Turrum-2, and Turrum-3, at about the Near Top L-200 surface in Turrum-1, Marlin-4, and Turrum-3, near the MFS "B" SB in Turrum-1, Turrum-3 (30 m above), and Turrum-4 (25 and 30 m above), and at about the 450 Marker surface in Turrum-3. Figure 2 show these maximum flooding intervals.

The Late Maastrichtian climate in this area was apparently humid and mild, with a cooling trend near the Cretaceous/Tertiary boundary (Askin, 1990). The composition of the palynomorphs and palynofacies assemblage in the basal part (uppermost Maastrictian to lower Paleocene) of the reservoir section implies a cool and wet climate. The palynomorph assemblage suggests that conditions became slightly drier during deposition of most of the upper part (post-MFS "A" SB) of the reservoir section.

In the uppermost part of the section, particularly above MFS "M", the assemblage suggests that climate became more humid and perhaps somewhat warmer. In this part of the section, spore and pollen from moisture-loving plant and those indicative of warm climates appear. The Eocene section that overlies the reservoir contains mangrove and palm species, which are associated with tropical to subtropical estuarine/coastal environments of deposition (Churchill, 1973; Muller, 1964; Germeraad et al., 1968) suggesting that the climate continued to warm during the Eocene time.

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APPENDIX A

Age Summary and Data

FIGURE 2. BIOSTRATIGRAPHY OF MARLIN-2, TURRUM RESERVOIR

A G E S U M M A R Y

(DEPTH IN METERS)

NO SAMPLES ABOVE A DEPTH OF 2231 METERS

2231	EARLY EOCENE SZ
2249	LATE PALEOCENE RA
2304	INDETERMINATE
2325	E. LATE PALEOCENE RC
2396	INDETERMINATE RD1?
2466	EARLY PALEOCENE RD2?
2522.4	EARLY PALEOCENE RE1
2551	E. E. PALEOC.-?LT. MAAST.? RF?
2591	E. E. PALEOC.-?LT. MAAST. RF
2648.6	INDETERMINATE
2676	E. E. PALEOC.-?LT. MAAST. RF
2700	PROB. L. MAASTRICHTIAN RG?
2755	INDETERMINATE
2786	LATE MAASTRICHTIAN? MA?
2867.7	LATE MAASTRICHTIAN MA
2874.7	BOTTOM WELL SAMPLE EXAMINED

FIGURE 2. BIOSTRATIGRAPHY OF MARLIN-2, TURRUM RESERVOIR

E N V I R O N M E N T S U M M A R Y

(DEPTH IN METERS)

NO SAMPLES ABOVE A DEPTH OF 2231 METERS

2231	MARGINAL MARINE
2259	NONMARINE
2313.9	MARGINAL MARINE
2325	MARGINAL MARINE-MARINE
2335	MARGINAL MARINE
2338.3	MARINE
2356	MARGINAL MARINE-MARINE
2374.3	MARGINAL MARINE
2383	MARGINAL MARINE-MARINE
2396	MARGINAL TO NONMARINE
2455.0	NONMARINE
2522.4	MARINE
2530	MARINE-MARGINAL MARINE
2551	MARGINAL MARINE
2582	NONMARINE
2755	MARGINAL-NONMARINE
2786	NONMARINE
2874.7	MARGINAL-NONMARINE
2874.7	BOTTOM WELL SAMPLE EXAMINED

FIGURE 2. BIOSTRATIGRAPHY OF MARLIN-2, TURRUM RESERVOIR

2231 METERS (DITCH SAMPLE)

AGE : EARLY EOCENE
SZ

ENVIRONMENT : MARGINAL MARINE

PRESERVATION : FAIR-POOR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN
DINOFLAGELLATES
APECTODINIUM SP. AFF. A. SPP.
PYXIDINOPSIS SP.
SENEGALINIUM DILWYNENSIS
SPORES AND POLLEN
CYATHIDITES SPP.
GLEICHENIIDITES SPP.
LAEVIGATOSPORITES SPP.
LYGISTEPOLLENITES BALMEI
NOTHOFAGIDITES BRACHYSPINULOSUS
NOTHOFAGIDITES EMARCUDUS/HETERUS
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PROTEACIDITES GRANDIS
PROTEACIDITES SPP.
STEREISPORITES ANTIQUASPORITES
TRICOLPITES RETICULATUS
TRICOLPITES SPP.

2249 METERS (DITCH SAMPLE)

AGE : LATE PALEOCENE
RA

ENVIRONMENT : MARGINAL MARINE

PRESERVATION : FAIR-POOR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS

FIGURE 2. BIOSTRATIGRAPHY OF MARLIN-2, TURRUM RESERVOIR

HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN
DINOFLAGELLATES
APECTODINIUM SP. AFF. A. SPP.
CYCLOPSIELLA SPP.
SENEGALINIUM DILWYNENSIS
SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
BACULATISPORITES SPP.
CYATHIDITES SPP.
GLEICHENIIDITES SPP.
LAEVIGATOSPORITES SPP.
LATROBOSPORITES OHAIENSIS
LILIACIDITES SPP.
LYGISTEPOLLENITES BALMEI
LYGISTEPOLLENITES FLORINII
MYRTACEIDITES TENUIS
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PODOSPORITES MICROSACCATUS
PROTEACIDITES ANGULALTUS
PROTEACIDITES SPP.
STEREISPORITES ANTIQUASPORITES
TRICOLPITES SPP.

2256.0 METERS (SIDE-WALL CORE)

AGE : LATE PALEOCENE
RA

ENVIRONMENT : MARGINAL MARINE

FAUNA & FLORA : FEW DRILLING MUD CONTAM.

PRESERVATION : FAIR-POOR

SPECIES: OTHER
BIODEGRADED TERRESTRIAL
BOTRYOCCUS SPP.
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (SPORE-POLLEN)
WOODY-COALY KEROGEN
DINOFLAGELLATES
CYCLOPSIELLA SPP.
DEFLANDREA SP. CF. D. MEDCALFII
GLAPHYROCYSTA SP. CF. G. SPP.
SENEGALINIUM SP. CF. S. DILWYNENSIS

FIGURE 2. BIOSTRATIGRAPHY OF MARLIN-2, TURRUM RESERVOIR

UNDIFFERENTIATED FORMS
VOZZHENNIKOVIA SP.

SPORES AND POLLEN
ARAUCARIACITES AUSTRALIS
AUSTALOPOLLIS OBSCURUS
BACULATISPORITES SPP.
CLAVIFERA TRIPLEX
CYATHIDITES SPP.
DILWYNITES GRANULATUS
DILWYNITES TUBERCULATUS
ERICIPITES SPP.
GAMBIERINA RUDATA
GLEICHENIIDITES SPP.
ISCHYOSPORITES IRREGULARIS
LAEVIGATOSPORITES SPP.
LATROBOSPORITES OHAIENSIS
LYGISTEPOLLENITES BALMEI
NOTHOFAGIDITES BRACHYSPINULOSUS
NOTHOFAGIDITES ENDURUS
PERIPOROPOLLENITES POLYPORATUS
PEROMONOLETES DENSUS
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PODOSPORITES MICROSACCATUS
PROTEACIDITES ANGULALTUS
PROTEACIDITES SPP.
SCHIZOCOLPUS MARLINENSIS
STEREISPORITES ANTIQUASPORITES
TETRACOLPITES SP.
TRICOLPITES SPP.
TRICOLPORITES SPP.

2259 METERS (DITCH SAMPLE)

AGE : LATE PALEOCENE
RA

ENVIRONMENT : NONMARINE

PRESERVATION : POOR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN

DINOFLAGELLATES

FIGURE 2. BIOSTRATIGRAPHY OF MARLIN-2, TURRUM RESERVOIR

SENEGALINIUM DILWYNENSIS
SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
CYATHIDITES SPP.
GLEICHENIIDITES SPP.
LAEVIGATOSPORITES SPP.
LYGISTEPOLLENITES BALMEI
NOTHOFAGIDITES ENDURUS
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PODOSPORITES MICROSACCATUS
PROTEACIDITES ANGULALTUS
PROTEACIDITES SPP.
TRICOLPITES PHILLIPSII

2274 METERS (DITCH SAMPLE)

AGE : LATE PALEOCENE
RA

ENVIRONMENT : NONMARINE

PRESERVATION : FAIR-POOR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN
DINOFLAGELLATES
APECTODINIUM SP. CF. A. SPP.
SENEGALINIUM DILWYNENSIS
THALASSIPHORA PELAGICA
TURBIOSPHAERA SP. CF. T. GALATEA
UNDIFFERENTIATED FORMS
SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
BACULATISPORITES SPP.
CYATHIDITES SPP.
GLEICHENIIDITES SPP.
HALORAGACIDITES HARRISII
LAEVIGATOSPORITES SPP.
LYGISTEPOLLENITES BALMEI
NOTHOFAGIDITES ENDURUS
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.

FIGURE 2. BIOSTRATIGRAPHY OF MARLIN-2, TURRUM RESERVOIR

PODOSPORITES MICROSACCATUS
PROTEACIDITES ANGULALTUS
PROTEACIDITES SPP.
TRICOLPORITES SPP.

2304 METERS (DITCH SAMPLE)

AGE : INDETERMINATE

ENVIRONMENT : NONMARINE

PRESERVATION : V POOR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
WOODY-COALY KEROGEN
DINOFLAGELLATES
UNDIFFERENTIATED FORMS
SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
BACULATISPORITES SPP.
LYGISTEPOLLENITES BALMEI
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES MICROSACCATUS
PROTEACIDITES SPP.
STEREISPORITES ANTIQUASPORITES

2313.9 METERS (SIDE-WALL CORE)

AGE : INDETERMINATE

ENVIRONMENT : MARGINAL MARINE

FAUNA & FLORA : RARE SPORE/POLLEN, SS

PRESERVATION : FAIR-POOR

SPECIES: OTHER
BIODEGRADED TERRESTRIAL
HERBACEOUS KEROGEN (SPORE-POLLEN)
WOODY-COALY KEROGEN
DINOFLAGELLATES
CYCLOPSIELLA SPP.

FIGURE 2. BIOSTRATIGRAPHY OF MARLIN-2, TURRUM RESERVOIR

SPORES AND POLLEN
- AUSTALOPOLLIS OBSCURUS
- DILWYNITES GRANULATUS
- GLEICHENIIDITES SPP.
- LAEVIGATOSPORITES SPP.
- LYGISTEPOLLENITES FLORINII
- NOTHOFAGIDITES ENDURUS
- PHYLLOCLADIDITES MAWSONII
- PODOCARPIDITES SPP.
- PROTEACIDITES ANGULALTUS
- PROTEACIDITES SPP.

2325 METERS (DITCH SAMPLE)

AGE : E. LATE PALEOCENE
RC

ENVIRONMENT : MARGINAL MARINE-MARINE

PRESERVATION : FAIR-POOR

SPECIES: OTHER
- AMORPHOUS KEROGEN
- BIODEGRADED TERRESTRIAL
- DINOFLAGELLATES-ACRITARCHS
- HERBACEOUS KEROGEN (CUTICLE)
- HERBACEOUS KEROGEN (SPORE-POLLEN)
- WOODY-COALY KEROGEN

DINOFLAGELLATES
- APECTODINIUM SPP.
- APECTODINIUM SP. AFF. A. SPP.
- GLAPHYROCYSTA RETIINTEXTA
- HAFNIASPHAERA SP.
- PALAEOCYSTODINIUM GOLZOWENSE
- PALAEOPERIDINIUM SP. CF. P. PYROPHORUM
- SENEGALINIUM DILWYNENSIS

SPORES AND POLLEN
- AUSTALOPOLLIS OBSCURUS
- GLEICHENIIDITES SPP.
- LYGISTEPOLLENITES BALMEI
- PHYLLOCLADIDITES MAWSONII
- PODOCARPIDITES SPP.
- PODOSPORITES ANTARCTICUS
- PODOSPORITES MICROSACCATUS
- PROTEACIDITES ADENANTHOIDES
- PROTEACIDITES SPP.

FIGURE 2. BIOSTRATIGRAPHY OF MARLIN-2, TURRUM RESERVOIR

2335 METERS (DITCH SAMPLE)

AGE : E. LATE PALEOCENE
RC

ENVIRONMENT : MARGINAL MARINE

PRESERVATION : V POOR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN
DINOFLAGELLATES
APECTODINIUM SP. AFF. A. SPP.
GLAPHYROCYSTA SPP.
SENEGALINIUM DILWYNENSIS
SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
LYGISTEPOLLENITES BALMEI
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PROTEACIDITES SPP.
STEREISPORITES (TRIPUNCTISPORIS) SP.

2338.3 METERS (SIDE-WALL CORE)

AGE : E. LATE PALEOCENE
RC

ENVIRONMENT : MARINE

PRESERVATION : FAIR-POOR

SPECIES: DINOFLAGELLATES
CERODINIUM SP. CF. C. SPECIOSUM
GLAPHYROCYSTA RETIINTEXTA
GLAPHYROCYSTA SPP.
PALAEOCYSTODINIUM SP. CF. P. SP.
SENEGALINIUM DILWYNENSIS
SPORES AND POLLEN
ARAUCARIACITES AUSTRALIS
AUSTALOPOLLIS OBSCURUS
BACULATISPORITES SPP.
CYATHAEIDITES GIGANTIS

FIGURE 2. BIOSTRATIGRAPHY OF MARLIN-2, TURRUM RESERVOIR

CYATHIDITES SPP.
DILWYNITES GRANULATUS
DILWYNITES TUBERCULATUS
GLEICHENIIDITES SPP.
HERKOSPORITES ELLIOTII
LAEVIGATOSPORITES SPP.
LATROBOSPORITES CRASSUS
LATROBOSPORITES OHAIENSIS
LYGISTEPOLLENITES BALMEI
LYGISTEPOLLENITES FLORINII
NOTHOFAGIDITES BRACHYSPINULOSUS
NOTHOFAGIDITES EMARCUDUS/HETERUS
NOTHOFAGIDITES ENDURUS
PHYLLOCLADIDITES MAWSONII
PHYLLOCLADIDITES RETICULOSACCATUS
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PROTEACIDITES ANGULALTUS
PROTEACIDITES SP. CF. P. ANNULARIS
PROTEACIDITES MINUTUS
PROTEACIDITES SPP.
STEREISPORITES ANTIQUASPORITES
TRICOLPITES SPP.

2356 METERS (DITCH SAMPLE)

AGE : E. LATE PALEOCENE
RC

ENVIRONMENT : MARGINAL MARINE-MARINE

FAUNA & FLORA : CAVED EOC., ABUN PYRITE SCARS

PRESERVATION : FAIR-V POOR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN
DINOFLAGELLATES
APECTODINIUM SP. AFF. A. SPP.
CERODINIUM SP. CF. C. SPECIOSUM
GLAPHYROCYSTA RETIINTEXTA
GLAPHYROCYSTA SPP.
HAFNIASPHAERA SP.
ISABELIDINIUM BAKERI

FIGURE 2. BIOSTRATIGRAPHY OF MARLIN-2, TURRUM RESERVOIR

ISABELIDINIUM SPP.
PALAEOCYSTODINIUM GOLZOWENSE
PALAEOPERIDINIUM PYROPHORUM
SENEGALINIUM DILWYNENSIS
SPINIFERITES SPP.
UNDIFFERENTIATED FORMS

SPORES AND POLLEN
GLEICHENIIDITES SPP.
LYGISTEPOLLENITES BALMEI
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PROTEACIDITES SPP.

2368 METERS (DITCH SAMPLE)

AGE : E. LATE PALEOCENE
RC

ENVIRONMENT : MARGINAL MARINE-MARINE

FAUNA & FLORA : CAVED EOC.

PRESERVATION : FAIR-V POOR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN

DINOFLAGELLATES
APECTODINIUM SPP.
APECTODINIUM SP. AFF. A. SPP.
CERODINIUM SP. CF. C. SPECIOSUM
DEFLANDREA SPP.
GLAPHYROCYSTA RETIINTEXTA
HAFNIASPHAERA SP.
ISABELIDINIUM SP. CF. I. SPP.
PALAEOCYSTODINIUM GOLZOWENSE
SENEGALINIUM DILWYNENSIS

SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
BACULATISPORITES SPP.
CYATHIDITES SPP.
DILWYNITES GRANULATUS
GLEICHENIIDITES SPP.
HALORAGACIDITES HARRISII

FIGURE 2. BIOSTRATIGRAPHY OF MARLIN-2, TURRUM RESERVOIR

LYGISTEPOLLENITES BALMEI
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PROTEACIDITES SPP.

2374.3 METERS (SIDE-WALL CORE)

AGE : E. LATE PALEOCENE
RC

ENVIRONMENT : MARGINAL MARINE

PRESERVATION : POOR, DRIED OUT

SPECIES: DINOFLAGELLATES
APECTODINIUM SPP.
CYCLOPSIELLA SPP.
PALAEOCYSTODINIUM SP. CF. P. SP.
SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
BACULATISPORITES SPP.
CYATHAEIDITES GIGANTIS
CYATHIDITES SPP.
DILWYNITES GRANULATUS
GLEICHENIIDITES SPP.
HALORAGACIDITES HARRISII
HERKOSPORITES ELLIOTII
LAEVIGATOSPORITES SPP.
LATROBOSPORITES CRASSUS
LYGISTEPOLLENITES BALMEI
LYGISTEPOLLENITES FLORINII
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PROTEACIDITES SPP.
STEREISPORITES ANTIQUASPORITES
TRICOLPITES PHILLIPSII
TRICOLPITES SPP.

2383 METERS (DITCH SAMPLE)

AGE : E. LATE PALEOCENE
RC

ENVIRONMENT : MARGINAL MARINE-MARINE

PRESERVATION : FAIR-V POOR

FIGURE 2. BIOSTRATIGRAPHY OF MARLIN-2, TURRUM RESERVOIR

SPECIES: OTHER
- AMORPHOUS KEROGEN
- BIODEGRADED TERRESTRIAL
- DINOFLAGELLATES-ACRITARCHS
- HERBACEOUS KEROGEN (CUTICLE)
- HERBACEOUS KEROGEN (SPORE-POLLEN)
- INDETERMINATE FINES
- WOODY-COALY KEROGEN

DINOFLAGELLATES
- APECTODINIUM HYPERACANTHUM
- APECTODINIUM SPP.
- APECTODINIUM SP. AFF. A. SPP.
- CERODINIUM SP. CF. C. SPECIOSUM
- CERODINIUM SPP.
- GLAPHYROCYSTA RETIINTEXTA
- PALAEOCYSTODINIUM GOLZOWENSE
- SENEGALINIUM DILWYNENSIS
- SPINIFERITES SPP.

SPORES AND POLLEN
- AUSTALOPOLLIS OBSCURUS
- CYATHIDITES SPP.
- HALORAGACIDITES HARRISII
- HERKOSPORITES ELLIOTII
- LYGISTEPOLLENITES BALMEI
- LYGISTEPOLLENITES FLORINII
- NOTHOFAGIDITES ENDURUS
- PHYLLOCLADIDITES MAWSONII
- PODOCARPIDITES SPP.
- PODOSPORITES ANTARCTICUS
- PROTEACIDITES SPP.

2396 METERS (DITCH SAMPLE)

AGE : INDETERMINATE
RD1?

ENVIRONMENT : MARGINAL TO NONMARINE

FAUNA & FLORA : NEARLY BARREN OF DINOS

PRESERVATION : POOR-V POOR

SPECIES: OTHER
- AMORPHOUS KEROGEN
- BIODEGRADED TERRESTRIAL
- DINOFLAGELLATES-ACRITARCHS
- HERBACEOUS KEROGEN (CUTICLE)
- HERBACEOUS KEROGEN (SPORE-POLLEN)
- INDETERMINATE FINES
- WOODY-COALY KEROGEN

FIGURE 2. BIOSTRATIGRAPHY OF MARLIN-2, TURRUM RESERVOIR

DINOFLAGELLATES
- APECTODINIUM SP. AFF. A. SPP.
- GLAPHYROCYSTA SPP.
- SENEGALINIUM DILWYNENSIS

SPORES AND POLLEN
- AUSTALOPOLLIS OBSCURUS
- LYGISTEPOLLENITES BALMEI
- NOTHOFAGIDITES ENDURUS
- PHYLLOCLADIDITES MAWSONII
- PODOCARPIDITES SPP.
- PROTEACIDITES SPP.

2408 METERS (DITCH SAMPLE)

AGE : INDETERMINATE
RD1?

ENVIRONMENT : MARGINAL TO NONMARINE

FAUNA & FLORA : MINOR CAVED EOCENE

PRESERVATION : POOR-V POOR

SPECIES: OTHER
- AMORPHOUS KEROGEN
- BIODEGRADED TERRESTRIAL
- DINOFLAGELLATES-ACRITARCHS
- HERBACEOUS KEROGEN (SPORE-POLLEN)
- INDETERMINATE FINES
- WOODY-COALY KEROGEN

DINOFLAGELLATES
- APECTODINIUM SPP.
- GLAPHYROCYSTA RETIINTEXTA
- GLAPHYROCYSTA SPP.
- PALAEOCYSTODINIUM GOLZOWENSE
- SENEGALINIUM DILWYNENSIS
- SPINIDINIUM SP. CF. S. SPP.

SPORES AND POLLEN
- AUSTALOPOLLIS OBSCURUS
- CYATHIDITES SPP.
- GLEICHENIIDITES SPP.
- LAEVIGATOSPORITES SPP.
- LYGISTEPOLLENITES BALMEI
- PHYLLOCLADIDITES MAWSONII
- PODOCARPIDITES SPP.
- PODOSPORITES ANTARCTICUS
- PROTEACIDITES SPP.

FIGURE 2. BIOSTRATIGRAPHY OF MARLIN-2, TURRUM RESERVOIR

2455.0 METERS (SIDE-WALL CORE)

AGE : INDETERMINATE
RD1?

ENVIRONMENT : NONMARINE

FAUNA & FLORA : SS

PRESERVATION : POOR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN
SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
CYATHAEIDITES GIGANTIS
CYATHIDITES SPP.
GLEICHENIIDITES SPP.
LAEVIGATOSPORITES SPP.
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PROTEACIDITES ANGULALTUS
PROTEACIDITES SPP.

2466 METERS (DITCH SAMPLE)

AGE : EARLY PALEOCENE
RD2?

ENVIRONMENT : NONMARINE

PRESERVATION : POOR-V POOR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN
DINOFLAGELLATES
SENEGALINIUM DILWYNENSIS
SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS

FIGURE 2. BIOSTRATIGRAPHY OF MARLIN-2, TURRUM RESERVOIR

DILWYNITES GRANULATUS
GLEICHENIIDITES SPP.
LAEVIGATOSPORITES SPP.
NOTHOFAGIDITES ENDURUS
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES MICROSACCATUS
PROTEACIDITES SPP.
STEREISPORITES ANTIQUASPORITES
TRICOLPITES SPP.

2475 METERS (DITCH SAMPLE)

AGE : EARLY PALEOCENE
RD2?

ENVIRONMENT : NONMARINE

FAUNA & FLORA : SOME EOCENE CAVINGS

PRESERVATION : POOR-V POOR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN
DINOFLAGELLATES
SENEGALINIUM DILWYNENSIS
SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
CYATHIDITES SPP.
GLEICHENIIDITES SPP.
LAEVIGATOSPORITES SPP.
LYGISTEPOLLENITES BALMEI
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES MICROSACCATUS
PROTEACIDITES SPP.
TRICOLPITES SPP.
TRICOLPORITES SPP.

2484.0 METERS (SIDE-WALL CORE)

AGE : EARLY PALEOCENE

FIGURE 2. BIOSTRATIGRAPHY OF MARLIN-2, TURRUM RESERVOIR

RD2?

ENVIRONMENT : NONMARINE

PRESERVATION : VERY POOR

SPECIES: DINOFLAGELLATES
APECTODINIUM SP. CF. A. SPP.
SENEGALINIUM DILWYNENSIS
SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
BACULATISPORITES SPP.
CLAVIFERA TRIPLEX
LYGISTEPOLLENITES BALMEI
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
TRICOLPITES PHILLIPSII
TRICOLPITES SPP.

2499 METERS (DITCH SAMPLE)

AGE : EARLY PALEOCENE
RD2?

ENVIRONMENT : NONMARINE

FAUNA & FLORA : CAVINGS

PRESERVATION : FAIR-POOR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN
SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
BACULATISPORITES SPP.
CYATHIDITES SPP.
DILWYNITES TUBERCULATUS
GLEICHENIIDITES SPP.
LAEVIGATOSPORITES SPP.
LATROBOSPORITES OHAIENSIS
LYGISTEPOLLENITES BALMEI
LYGISTEPOLLENITES FLORINII
NOTHOFAGIDITES ENDURUS
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.

FIGURE 2. BIOSTRATIGRAPHY OF MARLIN-2, TURRUM RESERVOIR

PODOSPORITES ANTARCTICUS
PODOSPORITES MICROSACCATUS
PROTEACIDITES ANGULALTUS
PROTEACIDITES SPP.
STEREISPORITES ANTIQUASPORITES
TRICOLPITES SPP.
TRICOLPORITES SPP.

2522.4 METERS (SIDE-WALL CORE)

AGE : EARLY PALEOCENE
RE1

ENVIRONMENT : MARINE

PRESERVATION : VERY POOR

SPECIES: DINOFLAGELLATES
CERODINIUM SP. CF. C. SPECIOSUM
DEFLANDREA SPP.
PALAEOPERIDINIUM SP. CF. P. PYROPHORUM
SENEGALINIUM DILWYNENSIS
SPINIDINIUM SP. CF. S. DENSISPINATUM
SPINIDINIUM MACMURDOENSE
UNDIFFERENTIATED FORMS
VOZZHENNIKOVIA SP. CF. V. SP.
SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
BACULATISPORITES SPP.
CLAVIFERA TRIPLEX
CYATHAEIDITES GIGANTIS
CYATHIDITES SPP.
GLEICHENIIDITES SPP.
LYGISTEPOLLENITES BALMEI
LYGISTEPOLLENITES FLORINII
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PROTEACIDITES SPP.
STEREISPORITES ANTIQUASPORITES
TRICOLPITES GILLII
TRICOLPITES PHILLIPSII
TRICOLPITES SPP.

2530 METERS (DITCH SAMPLE)

AGE : EARLY PALEOCENE

FIGURE 2. BIOSTRATIGRAPHY OF MARLIN-2, TURRUM RESERVOIR

RE1

ENVIRONMENT : MARINE-MARGINAL MARINE

FAUNA & FLORA : SOME CAVINGS

PRESERVATION : GOOD-V POOR

SPECIES: OTHER

AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN

DINOFLAGELLATES

APECTODINIUM SPP.
APECTODINIUM SP. AFF. A. SPP.
CERODINIUM SP. CF. C. SPECIOSUM
CERODINIUM SPP.
DEFLANDREA DARTMOORIA
PALAEOCYSTODINIUM AUSTRALINUM
PALAEOCYSTODINIUM GOLZOWENSE
SPINIDINIUM SP. CF. S. DENSISPINATUM
SPINIDINIUM SPP.
SPINIFERITES SPP.
VOZZHENNIKOVIA SPP.

SPORES AND POLLEN

AUSTALOPOLLIS OBSCURUS
HERKOSPORITES ELLIOTII
LYGISTEPOLLENITES BALMEI
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES MICROSACCATUS
PROTEACIDITES SPP.
STEREISPORITES ANTIQUASPORITES
TRICOLPITES GILLII
TRICOLPITES SPP.

2551 METERS (DITCH SAMPLE)

AGE : E. E. PALEOC.-?LT. MAAST.?
RF?

ENVIRONMENT : MARGINAL MARINE

PRESERVATION : FAIR-V POOR

SPECIES: OTHER

FIGURE 2. BIOSTRATIGRAPHY OF MARLIN-2, TURRUM RESERVOIR

AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN

DINOFLAGELLATES
CERODINIUM SP. CF. C. SPECIOSUM
DEFLANDREA SP. CF. D. SPP.
SENEGALINIUM DILWYNENSIS
UNDIFFERENTIATED FORMS

SPORES AND POLLEN
HALORAGACIDITES HARRISII
LAEVIGATOSPORITES SPP.
LILIACIDITES SPP.
LYGISTEPOLLENITES FLORINII
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES MICROSACCATUS
PROTEACIDITES SPP.
TRICOLPITES SPP.
TRICOLPORITES SPP.

2582 METERS (DITCH SAMPLE)

AGE : E. E. PALEOC.-?LT. MAAST.?
RF?

ENVIRONMENT : NONMARINE

FAUNA & FLORA : COAL, PARTLY

PRESERVATION : FAIR-V POOR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN

SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PROTEACIDITES SPP.

FIGURE 2. BIOSTRATIGRAPHY OF MARLIN-2, TURRUM RESERVOIR

2591 METERS (DITCH SAMPLE)

AGE : E. E. PALEOC.-?LT. MAAST.
RF

ENVIRONMENT : NONMARINE

PRESERVATION : FAIR-V POOR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN
SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
CYATHIDITES SPP.
DILWYNITES GRANULATUS
LAEVIGATOSPORITES SPP.
PODOCARPIDITES SPP.
PODOSPORITES MICROSACCATUS
PROTEACIDITES SPP.
STEREISPORITES ANTIQUASPORITES
TRICOLPITES SP. CF. T. CONFESSUS
TRICOLPITES PHILLIPSII
TRICOLPITES SPP.
TRICOLPORITES SPP.

2621 METERS (DITCH SAMPLE)

AGE : E. E. PALEOC.-?LT. MAAST.
RF

ENVIRONMENT : NONMARINE

FAUNA & FLORA : WOODY COAL, NEARLY BARREN

SPECIES: OTHER
BIODEGRADED TERRESTRIAL
HERBACEOUS KEROGEN (SPORE-POLLEN)
WOODY-COALY KEROGEN
SPORES AND POLLEN
PODOCARPIDITES SPP.

2636 METERS (DITCH SAMPLE)

FIGURE 2. BIOSTRATIGRAPHY OF MARLIN-2, TURRUM RESERVOIR

AGE : E. E. PALEOC.-?LT. MAAST.
RF

ENVIRONMENT : NONMARINE

PRESERVATION : FAIR-V POOR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN
SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
CYATHIDITES SPP.
HERKOSPORITES ELLIOTII
LYGISTEPOLLENITES BALMEI
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PROTEACIDITES ANGULALTUS
PROTEACIDITES SPP.
STEREISPORITES ANTIQUASPORITES
TRICOLPITES GILLII

2639 METERS (DITCH SAMPLE)

AGE : E. E. PALEOC.-?LT. MAAST.
RF

ENVIRONMENT : NONMARINE

FAUNA & FLORA : MINOR CAVINGS, (?APECTO)

PRESERVATION : POOR-V POOR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN
DINOFLAGELLATES
PALAEOCYSTODINIUM GOLZOWENSE
SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
GAMBIERINA RUDATA

FIGURE 2. BIOSTRATIGRAPHY OF MARLIN-2, TURRUM RESERVOIR

HERKOSPORITES ELLIOTII
NOTHOFAGIDITES ENDURUS
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PODOSPORITES MICROSACCATUS
PROTEACIDITES ANGULALTUS
PROTEACIDITES SPP.
STEREISPORITES (TRIPUNCTISPORIS) SP.
STEREISPORITES ANTIQUASPORITES
TRICOLPITES SP. CF. T. CONFESSUS
TRICOLPITES PHILLIPSII
TRICOLPITES SPP.
TRICOLPORITES SPP.

2648.6 METERS (SIDE-WALL CORE)

AGE : INDETERMINATE

ENVIRONMENT : NONMARINE

FAUNA & FLORA : COMM CONTAM FROM ABOVE (M EOC)

PRESERVATION : VERY POOR

SPECIES: SPORES AND POLLEN
DILWYNITES GRANULATUS
NOTHOFAGIDITES ENDURUS
PROTEACIDITES SPP.

2651.6 METERS (SIDE-WALL CORE)

AGE : INDETERMINATE

ENVIRONMENT : NONMARINE

FAUNA & FLORA : BARREN

2676 METERS (DITCH SAMPLE)

AGE : E. E. PALEOC.-?LT. MAAST.
RF

ENVIRONMENT : NONMARINE

FIGURE 2. BIOSTRATIGRAPHY OF MARLIN-2, TURRUM RESERVOIR

PRESERVATION : FAIR-POOR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN

SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
BACULATISPORITES SPP.
CYATHIDITES SPP.
GLEICHENIIDITES SPP.
HALORAGACIDITES HARRISII
HERKOSPORITES ELLIOTII
LAEVIGATOSPORITES SPP.
LYGISTEPOLLENITES BALMEI
LYGISTEPOLLENITES FLORINII
NOTHOFAGIDITES EMARCUDUS/HETERUS
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES MICROSACCATUS
PROTEACIDITES ANGULALTUS
PROTEACIDITES SPP.
STEREISPORITES (TRIPUNCTISPORIS) SP.
STEREISPORITES ANTIQUASPORITES
TETRACOLPORITES VERRUCOSUS
TRICOLPITES SP. CF. T. CONFESSUS
TRICOLPITES PHILLIPSII
TRICOLPITES SPP.
TRICOLPORITES SPP.

2700 METERS (DITCH SAMPLE)

AGE : PROB. L. MAASTRICHTIAN
RG?

ENVIRONMENT : NONMARINE

FAUNA & FLORA : FREQ. CAVINGS,(A. HOMO)

PRESERVATION : POOR-V POOR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES

FIGURE 2. BIOSTRATIGRAPHY OF MARLIN-2, TURRUM RESERVOIR

WOODY-COALY KEROGEN
DINOFLAGELLATES
UNDIFFERENTIATED FORMS
SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
CYATHIDITES SPP.
GLEICHENIIDITES SPP.
NOTHOFAGIDITES ENDURUS
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PODOSPORITES MICROSACCATUS
PROTEACIDITES ANGULALTUS
PROTEACIDITES SPP.
STEREISPORITES (TRIPUNCTISPORIS) SP.
STEREISPORITES ANTIQUASPORITES
TETRACOLPORITES VERRUCOSUS
TRICOLPITES GILLII
TRICOLPITES RETICULATUS
TRICOLPITES SPP.
TRICOLPORITES SPP.

2724 METERS (DITCH SAMPLE)

AGE : PROB. L. MAASTRICHTIAN
RG?

ENVIRONMENT : NONMARINE

PRESERVATION : POOR-V POOR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN
DINOFLAGELLATES
VOZZHENNIKOVIA APERTURA
SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
CYATHIDITES SPP.
GLEICHENIIDITES SPP.
LYGISTEPOLLENITES SP. CF. L. BALMEI
NOTHOFAGIDITES EMARCUDUS/HETERUS
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PODOSPORITES MICROSACCATUS

FIGURE 2. BIOSTRATIGRAPHY OF MARLIN-2, TURRUM RESERVOIR

PROTEACIDITES ANGULALTUS
PROTEACIDITES SPP.
STEREISPORITES (TRIPUNCTISPORIS) SP.
STEREISPORITES ANTIQUASPORITES
TETRACOLPORITES VERRUCOSUS
TRICOLPITES SP. CF. T. CONFESSUS
TRICOLPITES GILLII
TRICOLPITES PHILLIPSII
TRICOLPITES SPP.
TRICOLPORITES SPP.

2755 METERS (DITCH SAMPLE)

AGE : INDETERMINATE

ENVIRONMENT : MARGINAL-NONMARINE

FAUNA & FLORA : ABUND PYRITE

PRESERVATION : POOR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN
DINOFLAGELLATES
GLAPHYROCYSTA SP. CF. G. SPP.
PALAEOCYSTODINIUM GOLZOWENSE
UNDIFFERENTIATED FORMS
SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
CYATHIDITES SPP.
GLEICHENIIDITES SPP.
LAEVIGATOSPORITES SPP.
LILIACIDITES SPP.
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PROTEACIDITES ANGULALTUS
PROTEACIDITES SPP.
TRICOLPITES SPP.
TRIPOROPOLLENITES SP. CF. T. SECTILIS

2786 METERS (DITCH SAMPLE)

FIGURE 2. BIOSTRATIGRAPHY OF MARLIN-2, TURRUM RESERVOIR

AGE : LATE MAASTRICHTIAN?
MA?

ENVIRONMENT : NONMARINE

FAUNA & FLORA : SOME CAVINGS, A. HYP.

PRESERVATION : POOR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN
SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
CYATHIDITES SPP.
DILWYNITES TUBERCULATUS
GAMBIERINA SP. CF. G. EDWARSII
GLEICHENIIDITES SPP.
LAEVIGATOSPORITES SPP.
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PODOSPORITES MICROSACCATUS
PROTEACIDITES SP. CF. P. AMOLOSEXINUS
PROTEACIDITES ANGULALTUS
PROTEACIDITES SPP.
STEREISPORITES (TRIPUNCTISPORIS) SP.
STEREISPORITES ANTIQUASPORITES
TRICOLPITES CONFESSUS
TRICOLPITES SP. CF. T. CONFESSUS
TRICOLPITES GILLII
TRICOLPITES RETICULATUS
TRICOLPITES SPP.
TRICOLPORITES SPP.

2861.0 METERS (CONVENTIONAL CORE)

AGE : LATE MAASTRICHTIAN?
MA?

ENVIRONMENT : NONMARINE

FAUNA & FLORA : NEARLY BARREN

PRESERVATION : VERY POOR

FIGURE 2. BIOSTRATIGRAPHY OF MARLIN-2, TURRUM RESERVOIR

SPECIES: OTHER
BIODEGRADED TERRESTRIAL
HERBACEOUS KEROGEN (SPORE-POLLEN)
WOODY-COALY KEROGEN
SPORES AND POLLEN
GAMBIERINA EDWARSII
GLEICHENIIDITES SPP.
LYCOPODIUMSPORITES SPP.
PHYLLOCLADIDITES MAWSONII
PROTEACIDITES AMOLOSEXINUS
PROTEACIDITES SPP.

2867.7 METERS (CONVENTIONAL CORE)

AGE : LATE MAASTRICHTIAN
MA

ENVIRONMENT : NONMARINE

FAUNA & FLORA : ABUND S/P, SLIDE DRIED OUT,THICK

PRESERVATION : VERY POOR

SPECIES: OTHER
BIODEGRADED TERRESTRIAL
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
WOODY-COALY KEROGEN
SPORES AND POLLEN
BACULATISPORITES SPP.
CLASSOPOLLIS SPP.
CYATHAEIDITES GIGANTIS
GAMBIERINA EDWARSII
GAMBIERINA RUDATA
LAEVIGATOSPORITES SPP.
LATROBOSPORITES CRASSUS
LATROBOSPORITES OHAIENSIS
PROTEACIDITES AMOLOSEXINUS
PROTEACIDITES SPP.
STEREISPORITES (TRIPUNCTISPORIS) SP.
STEREISPORITES ANTIQUASPORITES
TRICOLPITES LONGUS
TRICOLPORITES LILLIEI

2874.7 METERS (CONVENTIONAL CORE)

AGE : LATE MAASTRICHTIAN

FIGURE 2. BIOSTRATIGRAPHY OF MARLIN-2, TURRUM RESERVOIR

MA

ENVIRONMENT : MARGINAL-NONMARINE

FAUNA & FLORA : COMM S/P

PRESERVATION : POOR-FAIR

SPECIES: OTHER
- BIODEGRADED TERRESTRIAL
- HERBACEOUS KEROGEN (CUTICLE)
- HERBACEOUS KEROGEN (SPORE-POLLEN)
- WOODY-COALY KEROGEN

DINOFLAGELLATES
- DEFLANDREA SPP.

SPORES AND POLLEN
- ARAUCARIACITES AUSTRALIS
- BACULATISPORITES SPP.
- EPHEDRIPITES SPP.
- GAMBIERINA RUDATA
- GLEICHENIIDITES SPP.
- GRAPNELISPORA EVANSII
- LATROBOSPORITES CRASSUS
- LATROBOSPORITES OHAIENSIS
- LYGISTEPOLLENITES FLORINII
- PHYLLOCLADIDITES MAWSONII
- PODOCARPIDITES SPP.
- PODOSPORITES ANTARCTICUS
- PROTEACIDITES AMOLOSEXINUS
- PROTEACIDITES SPP.
- STEREISPORITES ANTIQUASPORITES
- TRICOLPITES GILLII
- TRICOLPITES LONGUS
- TRICOLPITES SPP.
- TRICOLPORITES SPP.
- TRIPOROPOLLENITES SECTILIS

APPENDIX B

Age Summary and Data

FIGURE 3. BIOSTRATIGRAPHY OF TURRUM-4, TURRUM RESERVOIR

A G E S U M M A R Y

(DEPTH IN METERS)

NO SAMPLES ABOVE A DEPTH OF 2275 METERS

2275-80	EARLY EOCENE SZ
2290-95	LATE PALEOCENE RA
2320-25	LATE PALEOCENE RB
2365-70	E. LATE PALEOCENE? RC?
2375-80	E. LATE PALEOCENE RC
2470-75	L. EARLY PALEOCENE RD1
2525-30	EARLY PALEOCENE RD2
2580-85	EARLY PALEOCENE RE1
2630-35	EARLY PALEOCENE RE2
2655-60	E. E. PALEOC.-?LT. MAAST. RF
2726.0	INDETERMINATE
2750-55	PROB. L. MAASTRICHTIAN RG
2776.6	BOTTOM WELL SAMPLE EXAMINED

FIGURE 3. BIOSTRATIGRAPHY OF TURRUM-4, TURRUM RESERVOIR

E N V I R O N M E N T S U M M A R Y

(DEPTH IN METERS)

NO SAMPLES ABOVE A DEPTH OF 2275 METERS

2275-80	MARGINAL MARINE
2335-40	MARINE-MARGINAL MARINE
2365-70	MARGINAL MARINE
2375-80	MARGINAL MARINE-MARINE
2450-55	NON-MARGINAL MARINE
2470-75	MARINE-MARGINAL MARINE
2490-95	NON-MARGINAL MARINE
2503.5	MARINE
2510-15	NON-MARGINAL MARINE
2525-30	NONMARINE
2540-45	MARINE-MARGINAL MARINE
2541.0	MARGINAL MARINE-MARINE
2545-50	NON-MARGINAL MARINE
2560-65	MARGINAL MARINE-MARINE
2580-85	MARINE
2591.5	NONMARINE
2600-5	MARGINAL MARINE-MARINE
2655-60	NON-MARGINAL MARINE
2657.0	MARGINAL MARINE
2665-70	NONMARINE
2690-95	NON-MARGINAL MARINE
2703.0	NONMARINE

FIGURE 3. BIOSTRATIGRAPHY OF TURRUM-4, TURRUM RESERVOIR

E N V I R O N M E N T S U M M A R Y - C O N T I N U E D

(DEPTH IN METERS)

2716.0	MARINE-MARGINAL MARINE
2720-25	NON-MARGINAL MARINE
2726.0	NONMARINE
2750-55	MARGINAL MARINE-MARINE
2776.6	BOTTOM WELL SAMPLE EXAMINED

FIGURE 3. BIOSTRATIGRAPHY OF TURRUM-4, TURRUM RESERVOIR

2275-80 METERS (DITCH SAMPLE)

AGE : EARLY EOCENE
SZ

ENVIRONMENT : MARGINAL MARINE

FAUNA & FLORA : POORLY PRES. S/P

PRESERVATION : POOR-FAIR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
WOODY-COALY KEROGEN
DINOFLAGELLATES
APECTODINIUM SP. CF. A. SPP.
SENEGALINIUM DILWYNENSIS
SPINIFERITES SPP.
SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
DILWYNITES GRANULATUS
LYGISTEPOLLENITES BALMEI
NOTHOFAGIDITES BRACHYSPINULOSUS
NOTHOFAGIDITES ENDURUS
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PROTEACIDITES SPP.
STEREISPORITES ANTIQUASPORITES

2290-95 METERS (DITCH SAMPLE)

AGE : LATE PALEOCENE
RA

ENVIRONMENT : MARGINAL MARINE

FAUNA & FLORA : POORLY PRES. S/P

PRESERVATION : V POOR-FAIR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (CUTICLE)

FIGURE 3. BIOSTRATIGRAPHY OF TURRUM-4, TURRUM RESERVOIR

HERBACEOUS KEROGEN (SPORE-POLLEN)
WOODY-COALY KEROGEN
DINOFLAGELLATES
APECTODINIUM SP.
APECTODINIUM SP. CF. A. SPP.
CYCLOPSIELLA SPP.
DEFLANDREA SPP.
EISENACKIA SP. CF. E. CRASSITABULATA
SENEGALINIUM DILWYNENSIS
SPINIFERITES SPP.
UNDIFFERENTIATED FORMS
SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
CYATHAEIDITES GIGANTIS
GLEICHENIIDITES SPP.
LYGISTEPOLLENITES BALMEI
NOTHOFAGIDITES ENDURUS
NOTHOFAGIDITES SPP.
PODOCARPIDITES SPP.
PROTEACIDITES ANGULALTUS
PROTEACIDITES SPP.
STEREISPORITES ANTIQUASPORITES
TRICOLPITES GILLII

2305-10 METERS (DITCH SAMPLE)

AGE : LATE PALEOCENE
RA

ENVIRONMENT : MARGINAL MARINE

FAUNA & FLORA : SOME PYRITE SCARS

PRESERVATION : V POOR-FAIR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (SPORE-POLLEN)
PEDIASTRUM SP. CF. P. SPP.
WOODY-COALY KEROGEN
DINOFLAGELLATES
APECTODINIUM SP. CF. A. SPP.
CYCLOPSIELLA SPP.
DEFLANDREA SPP.
GLAPHYROCYSTA SPP.
PALAEOCYSTODINIUM SP. CF. P. GOLZOWENSE
PARALECANIELLA INDENTATA
SENEGALINIUM DILWYNENSIS

FIGURE 3. BIOSTRATIGRAPHY OF TURRUM-4, TURRUM RESERVOIR

SPINIFERITES SPP.
UNDIFFERENTIATED FORMS

SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
DILWYNITES TUBERCULATUS
GLEICHENIIDITES SPP.
LAEVIGATOSPORITES SPP.
LYGISTEPOLLENITES BALMEI
LYGISTEPOLLENITES FLORINII
NOTHOFAGIDITES BRACHYSPINULOSUS
NOTHOFAGIDITES EMARCUDUS/HETERUS
NOTHOFAGIDITES ENDURUS
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PODOSPORITES MICROSACCATUS
PROTEACIDITES ANGULALTUS
PROTEACIDITES SPP.
STEREISPORITES ANTIQUASPORITES
TRICOLPITES GILLII

2308 METERS (SIDE-WALL CORE)

AGE : LATE PALEOCENE
RA

ENVIRONMENT : MARGINAL MARINE

FAUNA & FLORA : ABUN PYRITE SCARS

PRESERVATION : V POOR-FAIR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
PEDIASTRUM SP. CF. P. SPP.
WOODY-COALY KEROGEN

DINOFLAGELLATES
APECTODINIUM SP. CF. A. SPP.
CYCLOPSIELLA SPP.
DEFLANDREA SPP.
GLAPHYROCYSTA SPP.
PALAEOCYSTODINIUM SP. CF. P. GOLZOWENSE
PARALECANIELLA INDENTATA
SENEGALINIUM DILWYNENSIS
SPINIFERITES SPP.
UNDIFFERENTIATED FORMS

FIGURE 3. BIOSTRATIGRAPHY OF TURRUM-4, TURRUM RESERVOIR

SPORES AND POLLEN
- AUSTALOPOLLIS OBSCURUS
- BACULATISPORITES SPP.
- CYATHIDITES SPP.
- DILWYNITES GRANULATUS
- DILWYNITES TUBERCULATUS
- EPHEDRIPITES NOTENSIS
- GLEICHENIIDITES SPP.
- HERKOSPORITES ELLIOTII
- LAEVIGATOSPORITES SPP.
- LATROBOSPORITES CRASSUS
- LATROBOSPORITES OHAIENSIS
- LYGISTEPOLLENITES BALMEI
- LYGISTEPOLLENITES FLORINII
- NOTHOFAGIDITES EMARCUDUS/HETERUS
- NOTHOFAGIDITES ENDURUS
- PEROMONOLETES DENSUS
- PHYLLOCLADIDITES MAWSONII
- PODOCARPIDITES SPP.
- PODOSPORITES ANTARCTICUS
- PODOSPORITES MICROSACCATUS
- PROTEACIDITES ANGULALTUS
- PROTEACIDITES ANNULARIS
- PROTEACIDITES SPP.
- STEREISPORITES (TRIPUNCTISPORIS) SP.
- STEREISPORITES ANTIQUASPORITES
- TRICOLPITES GILLII
- TRICOLPITES PHILLIPSII
- TRICOLPITES SPP.

2320-25 METERS (DITCH SAMPLE)

AGE : LATE PALEOCENE
RB

ENVIRONMENT : MARGINAL MARINE

PRESERVATION : V POOR-FAIR

SPECIES: OTHER
- AMORPHOUS KEROGEN
- BIODEGRADED TERRESTRIAL
- DINOFLAGELLATES-ACRITARCHS
- HERBACEOUS KEROGEN (SPORE-POLLEN)
- INDETERMINATE FINES
- WOODY-COALY KEROGEN

DINOFLAGELLATES
- APECTODINIUM SP. CF. A. SPP.
- CYCLOPSIELLA SPP.
- GLAPHYROCYSTA RETIINTEXTA

FIGURE 3. BIOSTRATIGRAPHY OF TURRUM-4, TURRUM RESERVOIR

GLAPHYROCYSTA SPP.
PALAEOCYSTODINIUM SP. CF. P. GOLZOWENSE
PARALECANIELLA INDENTATA
SENEGALINIUM DILWYNENSIS
SPINIFERITES SPP.
UNDIFFERENTIATED FORMS

SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
GLEICHENIIDITES SPP.
LAEVIGATOSPORITES SPP.
LYGISTEPOLLENITES BALMEI
NOTHOFAGIDITES ENDURUS
PHYLLOCLADIDITES MAWSONII
PODOSPORITES MICROSACCATUS
PROTEACIDITES SP. CF. P. ANGULALTUS
PROTEACIDITES SPP.
STEREISPORITES (TRIPUNCTISPORIS) SP.
STEREISPORITES ANTIQUASPORITES

2335-40 METERS (DITCH SAMPLE)

AGE : LATE PALEOCENE
RB

ENVIRONMENT : MARINE-MARGINAL MARINE

PRESERVATION : V POOR-FAIR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
BOTRYOCCUS SPP.
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (SPORE-POLLEN)
WOODY-COALY KEROGEN

DINOFLAGELLATES
APECTODINIUM SP.
APECTODINIUM SP. CF. A. SPP.
CERODINIUM SP. CF. C. SPECIOSUM
CYCLOPSIELLA SPP.
DEFLANDREA SPP.
GLAPHYROCYSTA RETIINTEXTA
GLAPHYROCYSTA SPP.
OPERCULODINIUM CENTROCARPUM
OPERCULODINIUM SPP.
PALAEOCYSTODINIUM SP. CF. P. GOLZOWENSE
PARALECANIELLA INDENTATA
SENEGALINIUM DILWYNENSIS
SPINIFERITES SPP.
UNDIFFERENTIATED FORMS

FIGURE 3. BIOSTRATIGRAPHY OF TURRUM-4, TURRUM RESERVOIR

SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
CYATHIDITES SPP.
GLEICHENIIDITES SPP.
LYGISTEPOLLENITES BALMEI
LYGISTEPOLLENITES FLORINII
NOTHOFAGIDITES ENDURUS
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES MICROSACCATUS
PROTEACIDITES SPP.
STEREISPORITES ANTIQUASPORITES

2355-60 METERS (DITCH SAMPLE)

AGE : LATE PALEOCENE
RB

ENVIRONMENT : MARINE-MARGINAL MARINE

PRESERVATION : V POOR-FAIR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN
DINOFLAGELLATES
ACHOMOSPHAERA SP. CF. A. CRASSIPELLIS
APECTODINIUM SP.
APECTODINIUM SP. CF. A. SPP.
DEFLANDREA SPP.
GLAPHYROCYSTA RETIINTEXTA
GLAPHYROCYSTA SPP.
OPERCULODINIUM CENTROCARPUM
PALAEOCYSTODINIUM GOLZOWENSE
SENEGALINIUM DILWYNENSIS
SPINIFERITES SPP.
TURBIOSPHAERA SP. CF. T. FILOSA
UNDIFFERENTIATED FORMS
SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
DILWYNITES GRANULATUS
GLEICHENIIDITES SPP.
HALORAGACIDITES HARRISII
LATROBOSPORITES OHAIENSIS
LYGISTEPOLLENITES BALMEI
LYGISTEPOLLENITES FLORINII

FIGURE 3. BIOSTRATIGRAPHY OF TURRUM-4, TURRUM RESERVOIR

NOTHOFAGIDITES EMARCUDUS/HETERUS
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES MICROSACCATUS
PROTEACIDITES ANGULALTUS
PROTEACIDITES SPP.
STEREISPORITES ANTIQUASPORITES

2365-70 METERS (DITCH SAMPLE)

AGE : E. LATE PALEOCENE?
RC?

ENVIRONMENT : MARGINAL MARINE

FAUNA & FLORA : MIOCENE/EOCENE CAVINGS

PRESERVATION : V POOR-FAIR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN

DINOFLAGELLATES
APECTODINIUM SP.
APECTODINIUM SP. CF. A. SPP.
CERODINIUM SP. CF. C. SPECIOSUM
OPERCULODINIUM CENTROCARPUM
SENEGALINIUM DILWYNENSIS
UNDIFFERENTIATED FORMS

SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
BACULATISPORITES SPP.
CYATHIDITES SPP.
GLEICHENIIDITES SPP.
LAEVIGATOSPORITES SPP.
LYGISTEPOLLENITES BALMEI
LYGISTEPOLLENITES FLORINII
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PODOSPORITES MICROSACCATUS
PROTEACIDITES SP. CF. P. ANGULALTUS
PROTEACIDITES SPP.
STEREISPORITES ANTIQUASPORITES

FIGURE 3. BIOSTRATIGRAPHY OF TURRUM-4, TURRUM RESERVOIR

2375-80 METERS (DITCH SAMPLE)

AGE : E. LATE PALEOCENE
RC

ENVIRONMENT : MARGINAL MARINE-MARINE

FAUNA & FLORA : CAVINGS

PRESERVATION : V POOR-FAIR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN
DINOFLAGELLATES
ALISOCYSTA CIRCUMTABULATA
APECTODINIUM SP.
APECTODINIUM SP. CF. A. SPP.
DEFLANDREA SP.
GLAPHYROCYSTA RETIINTEXTA
PALAEOPERIDINIUM SP. CF. P. PYROPHORUM
SENEGALINIUM DILWYNENSIS
SPINIFERITES SPP.
UNDIFFERENTIATED FORMS
SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
CYATHIDITES SPP.
LAEVIGATOSPORITES SPP.
LYGISTEPOLLENITES BALMEI
LYGISTEPOLLENITES FLORINII
NOTHOFAGIDITES ENDURUS
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES MICROSACCATUS
PROTEACIDITES ANGULALTUS
PROTEACIDITES SPP.
STEREISPORITES (TRIPUNCTISPORIS) SP.

2390 METERS (SIDE-WALL CORE)

AGE : E. LATE PALEOCENE
RC

ENVIRONMENT : MARGINAL MARINE-MARINE

FAUNA & FLORA : COMM REWRKD P/TR,91.3/10,94/10

FIGURE 3. BIOSTRATIGRAPHY OF TURRUM-4, TURRUM RESERVOIR

PRESERVATION : FAIR-POOR

SPECIES: OTHER

- AMORPHOUS KEROGEN
- BIODEGRADED TERRESTRIAL
- DINOFLAGELLATES-ACRITARCHS
- HERBACEOUS KEROGEN (SPORE-POLLEN)
- INDETERMINATE FINES
- WOODY-COALY KEROGEN

DINOFLAGELLATES

- ALISOCYSTA CIRCUMTABULATA
- ALISOCYSTA SP. CF. A. RETICULATA
- APECTODINIUM SP.
- APECTODINIUM SP. CF. A. SPP.
- CERODINIUM SP. CF. C. SPECIOSUM
- CYCLOPSIELLA SPP.
- DEFLANDREA PACHYCEROS
- DEFLANDREA SP.
- DEFLANDREA SPP.
- EISENACKIA CRASSITABULATA
- GLAPHYROCYSTA RETIINTEXTA
- PALAEOCYSTODINIUM GOLZOWENSE
- PALAEOPERIDINIUM SP. CF. P. PYROPHORUM
- SENEGALINIUM DILWYNENSIS
- SPINIFERITES SPP.
- UNDIFFERENTIATED FORMS
- VERYHACHIUM SPP.
- VOZZHENNIKOVIA APERTURA
- VOZZHENNIKOVIA SPP.

SPORES AND POLLEN

- AUSTALOPOLLIS OBSCURUS
- CYATHIDITES SPP.
- DILWYNITES GRANULATUS
- GAMBIERINA RUDATA
- GLEICHENIIDITES SPP.
- HALORAGACIDITES SP. CF. H. HARRISII
- HERKOSPORITES ELLIOTII
- LAEVIGATOSPORITES SPP.
- LILIACIDITES SPP.
- LYGISTEPOLLENITES BALMEI
- LYGISTEPOLLENITES FLORINII
- MALVACILPOLLIS SUBTILIS
- NOTHOFAGIDITES EMARCUDUS/HETERUS
- NOTHOFAGIDITES ENDURUS
- PEROMONOLETES DENSUS
- PHYLLOCLADIDITES MAWSONII
- PODOCARPIDITES SPP.
- PODOSPORITES ANTARCTICUS
- PODOSPORITES MICROSACCATUS
- PROTEACIDITES ANGULALTUS
- PROTEACIDITES ANNULARIS
- PROTEACIDITES SPP.
- RUGULATISPORITES MALLATUS

FIGURE 3. BIOSTRATIGRAPHY OF TURRUM-4, TURRUM RESERVOIR

STEREISPORITES (TRIPUNCTISPORIS) SP.
STEREISPORITES ANTIQUASPORITES
TETRACOLPORITES VERRUCOSUS
TRICOLPITES GILLII
TRICOLPITES SPP.

2415-20 METERS (DITCH SAMPLE)

AGE : E. LATE PALEOCENE
RC

ENVIRONMENT : MARGINAL MARINE-MARINE

FAUNA & FLORA : ABUN PYRITE

PRESERVATION : V POOR-FAIR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
BOTRYOCCUS SPP.
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN
DINOFLAGELLATES
APECTODINIUM SP.
APECTODINIUM SP. CF. A. SPP.
CERODINIUM SP. CF. C. SPECIOSUM
CYCLOPSIELLA SPP.
DEFLANDREA SPP.
GLAPHYROCYSTA RETIINTEXTA
OPERCULODINIUM CENTROCARPUM
PALAEOCYSTODINIUM GOLZOWENSE
SENEGALINIUM DILWYNENSIS
SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
BACULATISPORITES SPP.
CYATHIDITES SPP.
GLEICHENIIDITES SPP.
LAEVIGATOSPORITES SPP.
LYGISTEPOLLENITES BALMEI
LYGISTEPOLLENITES FLORINII
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES MICROSACCATUS
PROTEACIDITES ANGULALTUS
PROTEACIDITES SPP.
STEREISPORITES ANTIQUASPORITES

FIGURE 3. BIOSTRATIGRAPHY OF TURRUM-4, TURRUM RESERVOIR

2450-55 METERS (DITCH SAMPLE)

AGE : E. LATE PALEOCENE
RC

ENVIRONMENT : NON-MARGINAL MARINE

PRESERVATION : V POOR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
PEDIASTRUM SP. CF. P. SPP.
WOODY-COALY KEROGEN
DINOFLAGELLATES
DEFLANDREA SPP.
GLAPHYROCYSTA RETIINTEXTA
PALAEOCYSTODINIUM GOLZOWENSE
SENEGALINIUM DILWYNENSIS
SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
BACULATISPORITES SPP.
CYATHIDITES SPP.
LAEVIGATOSPORITES SPP.
LYGISTEPOLLENITES BALMEI
LYGISTEPOLLENITES FLORINII
NOTHOFAGIDITES ENDURUS
PODOCARPIDITES SPP.
STEREISPORITES ANTIQUASPORITES

2470-75 METERS (DITCH SAMPLE)

AGE : L. EARLY PALEOCENE
RD1

ENVIRONMENT : MARINE-MARGINAL MARINE

PRESERVATION : POOR-FAIR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN

FIGURE 3. BIOSTRATIGRAPHY OF TURRUM-4, TURRUM RESERVOIR

DINOFLAGELLATES
- ALISOCYSTA RETICULATA
- APECTODINIUM SP. CF. A. SPP.
- CERODINIUM SP. CF. C. SPECIOSUM
- DEFLANDREA SPP.
- EISENACKIA SP. CF. E. CRASSITABULATA
- FIBROCYSTA SPP.
- GLAPHYROCYSTA RETIINTEXTA
- PALAEOCYSTODINIUM GOLZOWENSE
- SENEGALINIUM DILWYNENSIS
- SPINIDINIUM DENSISPINATUM
- SPINIDINIUM SPP.
- SPINIFERITES SPP.
- VOZZHENNIKOVIA ANGULATA
- VOZZHENNIKOVIA APERTURA

SPORES AND POLLEN
- AUSTALOPOLLIS OBSCURUS
- BACULATISPORITES SPP.
- CYATHIDITES SPP.
- DILWYNITES TUBERCULATUS
- LAEVIGATOSPORITES SPP.
- LYGISTEPOLLENITES BALMEI
- LYGISTEPOLLENITES FLORINII
- NOTHOFAGIDITES EMARCUDUS/HETERUS
- PEROMONOLETES DENSUS
- PHYLLOCLADIDITES MAWSONII
- PODOCARPIDITES SPP.
- PODOSPORITES ANTARCTICUS
- PODOSPORITES MICROSACCATUS
- PROTEACIDITES ANGULALTUS
- PROTEACIDITES SPP.
- STEREISPORITES (TRIPUNCTISPORIS) SP.
- STEREISPORITES ANTIQUASPORITES
- TRICOLPITES GILLII
- TRICOLPITES PHILLIPSII
- TRICOLPITES SPP.

2490-95 METERS (DITCH SAMPLE)

AGE : L. EARLY PALEOCENE
RD1

ENVIRONMENT : NON-MARGINAL MARINE

FAUNA & FLORA : SANDSTONE

PRESERVATION : POOR

SPECIES: OTHER
BIODEGRADED TERRESTRIAL

FIGURE 3. BIOSTRATIGRAPHY OF TURRUM-4, TURRUM RESERVOIR

DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN

DINOFLAGELLATES
APECTODINIUM SP. CF. A. SPP.
GLAPHYROCYSTA RETIINTEXTA
GLAPHYROCYSTA SPP.

SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
CYATHIDITES SPP.
DILWYNITES GRANULATUS
LAEVIGATOSPORITES SPP.
LYGISTEPOLLENITES BALMEI
NOTHOFAGIDITES ENDURUS
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PODOSPORITES MICROSACCATUS
PROTEACIDITES SPP.
STEREISPORITES ANTIQUASPORITES

2503.5 METERS (SIDE-WALL CORE)

AGE : L. EARLY PALEOCENE
RD1

ENVIRONMENT : MARINE

PRESERVATION : POOR-FAIR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
BOTRYOCCUS SPP.
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN

DINOFLAGELLATES
ACHOMOSPHAERA CRASSIPELLIS
ALISOCYSTA CIRCUMTABULATA
APECTODINIUM SP.
APECTODINIUM SP. CF. A. SPP.
CERODINIUM SP. CF. C. SPECIOSUM
DEFLANDREA SPP.
GLAPHYROCYSTA RETIINTEXTA
ISABELIDINIUM SP. CF. I. BAKERI
PALAEOCYSTODINIUM GOLZOWENSE

FIGURE 3. BIOSTRATIGRAPHY OF TURRUM-4, TURRUM RESERVOIR

PALAEOPERIDINIUM SP. CF. P. PYROPHORUM
SENEGALINIUM DILWYNENSIS
SPINIDINIUM ESSOI
SPINIDINIUM SPP.
SPINIFERITES SPP.
SYSTEMATOPHORA SP.
TURBIOSPHAERA FILOSA
UNDIFFERENTIATED FORMS

SPORES AND POLLEN

AUSTALOPOLLIS OBSCURUS
BACULATISPORITES SPP.
DILWYNITES GRANULATUS
DILWYNITES TUBERCULATUS
GAMBIERINA RUDATA
GLEICHENIIDITES SPP.
GOTHANIPOLLIS BASSENSIS A
HALORAGACIDITES HARRISII
HERKOSPORITES ELLIOTII
ISCHYOSPORITES IRREGULARIS
JUXTACOLPUS PIERATUS
LAEVIGATOSPORITES SPP.
LATROBOSPORITES CRASSUS
LYGISTEPOLLENITES BALMEI
LYGISTEPOLLENITES FLORINII
NOTHOFAGIDITES BRACHYSPINULOSUS
NOTHOFAGIDITES EMARCUDUS/HETERUS
PEROMONOLETES DENSUS
PHYLLOCLADIDITES MAWSONII
PODOSPORITES ANTARCTICUS
PODOSPORITES MICROSACCATUS
PROTEACIDITES ANGULALTUS
PROTEACIDITES SPP.
STEREISPORITES (TRIPUNCTISPORIS) SP.
STEREISPORITES ANTIQUASPORITES
TETRACOLPORITES VERRUCOSUS
TRICOLPITES GILLII
TRICOLPITES PHILLIPSII
TRICOLPITES SPP.

2510-15 METERS (DITCH SAMPLE)

AGE : L. EARLY PALEOCENE
RD1

ENVIRONMENT : NON-MARGINAL MARINE

PRESERVATION : POOR-FAIR

SPECIES: OTHER
AMORPHOUS KEROGEN

FIGURE 3. BIOSTRATIGRAPHY OF TURRUM-4, TURRUM RESERVOIR

BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN

DINOFLAGELLATES
GLAPHYROCYSTA RETIINTEXTA
OPERCULODINIUM CENTROCARPUM
OPERCULODINIUM SP. CF. O. SPP.
PALAEOPERIDINIUM SP. CF. P. PYROPHORUM

SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
CYATHIDITES SPP.
GLEICHENIIDITES SPP.
LYGISTEPOLLENITES BALMEI
LYGISTEPOLLENITES FLORINII
NOTHOFAGIDITES ENDURUS
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PROTEACIDITES ANGULALTUS
PROTEACIDITES SPP.
STEREISPORITES (TRIPUNCTISPORIS) SP.
STEREISPORITES ANTIQUASPORITES
TRICOLPITES PHILLIPSII

2515-20 METERS (DITCH SAMPLE)

AGE : L. EARLY PALEOCENE
RD1

ENVIRONMENT : NON-MARGINAL MARINE

PRESERVATION : POOR-FAIR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN

DINOFLAGELLATES
CERODINIUM SP. CF. C. SPECIOSUM
DEFLANDREA SPP.
GLAPHYROCYSTA RETIINTEXTA
SENEGALINIUM DILWYNENSIS
SPINIFERITES SPP.
UNDIFFERENTIATED FORMS

SPORES AND POLLEN

FIGURE 3. BIOSTRATIGRAPHY OF TURRUM-4, TURRUM RESERVOIR

AUSTALOPOLLIS OBSCURUS
CYATHIDITES SPP.
DILWYNITES GRANULATUS
GLEICHENIIDITES SPP.
HERKOSPORITES ELLIOTII
ISCHYOSPORITES SPP.
LAEVIGATOSPORITES SPP.
LYGISTEPOLLENITES BALMEI
LYGISTEPOLLENITES FLORINII
NOTHOFAGIDITES ENDURUS
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PROTEACIDITES SP. CF. P. ANGULALTUS
PROTEACIDITES SPP.
TRICOLPITES GILLII

2525-30 METERS (DITCH SAMPLE)

AGE : EARLY PALEOCENE
RD2

ENVIRONMENT : NONMARINE

FAUNA & FLORA : COAL W/ ABUN AMORP KER, PYRITE

PRESERVATION : POOR-FAIR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN
DINOFLAGELLATES
APECTODINIUM SP. CF. A. SPP.
SENEGALINIUM DILWYNENSIS
SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
CYATHIDITES SPP.
GLEICHENIIDITES SPP.
LAEVIGATOSPORITES SPP.
LYGISTEPOLLENITES BALMEI
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PODOSPORITES MICROSACCATUS
PROTEACIDITES SPP.

FIGURE 3. BIOSTRATIGRAPHY OF TURRUM-4, TURRUM RESERVOIR

TRICOLPITES SPP.
TRICOLPORITES SPP.

2528.5 METERS (SIDE-WALL CORE)

AGE : EARLY PALEOCENE
RD2

ENVIRONMENT : NONMARINE

FAUNA & FLORA : COAL
NO KEROGEN SLIDE

PRESERVATION : FAIR-POOR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
WOODY-COALY KEROGEN
SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
CICATRICOSISPORITES AUSTRALIENSIS
CYATHAEIDITES GIGANTIS
CYATHIDITES SPP.
DILWYNITES GRANULATUS
GAMBIERINA EDWARSII
GAMBIERINA RUDATA
GLEICHENIIDITES SPP.
HERKOSPORITES ELLIOTII
JUXTACOLPUS PIERATUS
LAEVIGATOSPORITES SPP.
LATROBOSPORITES CRASSUS
LATROBOSPORITES OHAIENSIS
LYGISTEPOLLENITES BALMEI
LYGISTEPOLLENITES FLORINII
NOTHOFAGIDITES BRACHYSPINULOSUS
PEROMONOLETES DENSUS
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PODOSPORITES MICROSACCATUS
PROTEACIDITES ANGULALTUS
PROTEACIDITES SPP.
RETITRICOLPITES SPP.
STEREISPORITES (TRIPUNCTISPORIS) SP.
STEREISPORITES ANTIQUASPORITES
TETRACOLPORITES VERRUCOSUS
TRICOLPITES PHILLIPSII

FIGURE 3. BIOSTRATIGRAPHY OF TURRUM-4, TURRUM RESERVOIR

TRICOLPORITES SPP.
TRILETES TUBERCULIFORMIS

2540-45 METERS (DITCH SAMPLE)

AGE : EARLY PALEOCENE
RD2

ENVIRONMENT : MARINE-MARGINAL MARINE

FAUNA & FLORA : SOME MINUTE PYRITE

PRESERVATION : V POOR-POOR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN

DINOFLAGELLATES
APECTODINIUM SP.
APECTODINIUM SP. CF. A. SPP.
DEFLANDREA SPP.
GLAPHYROCYSTA SPP.
HYSTRICHOSPHAERIDIUM SPP.
OPERCULODINIUM CENTROCARPUM
PALAEOCYSTODINIUM GOLZOWENSE
SENEGALINIUM DILWYNENSIS
SPINIDINIUM ESSOI
SPINIDINIUM SPP.
SPINIFERITES SPP.
UNDIFFERENTIATED FORMS
VOZZHENNIKOVIA APERTURA
VOZZHENNIKOVIA SP. CF. V. ECHINOIDEA
VOZZHENNIKOVIA SPP.

SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
BACULATISPORITES SPP.
LYGISTEPOLLENITES BALMEI
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.

2541.0 METERS (SIDE-WALL CORE)

AGE : EARLY PALEOCENE
RD2

FIGURE 3. BIOSTRATIGRAPHY OF TURRUM-4, TURRUM RESERVOIR

ENVIRONMENT : MARGINAL MARINE-MARINE

FAUNA & FLORA : FREQ PYRITE CRYSTALS

PRESERVATION : POOR

SPECIES: OTHER
- AMORPHOUS KEROGEN
- BIODEGRADED TERRESTRIAL
- DINOFLAGELLATES-ACRITARCHS
- HERBACEOUS KEROGEN (CUTICLE)
- HERBACEOUS KEROGEN (SPORE-POLLEN)
- WOODY-COALY KEROGEN

DINOFLAGELLATES
- APECTODINIUM SP. CF. A. HYPERACANTHUM
- APECTODINIUM SP.
- APECTODINIUM SP. CF. A. SPP.
- CYCLOPSIELLA SPP.
- SENEGALINIUM DILWYNENSIS
- SPINIDINIUM SPP.

SPORES AND POLLEN
- AUSTALOPOLLIS OBSCURUS
- BACULATISPORITES SPP.
- CICATRICOSISPORITES AUSTRALIENSIS
- CYATHAEIDITES GIGANTIS
- DILWYNITES GRANULATUS
- GAMBIERINA EDWARSII
- GLEICHENIIDITES SPP.
- HERKOSPORITES ELLIOTII
- LAEVIGATOSPORITES SPP.
- LYGISTEPOLLENITES BALMEI
- PHYLLOCLADIDITES MAWSONII
- PHYLLOCLADIDITES OVALIS
- PODOCARPIDITES SPP.
- PODOSPORITES MICROSACCATUS
- PROTEACIDITES ANGULALTUS
- PROTEACIDITES SPP.
- STEREISPORITES (TRIPUNCTISPORIS) SP.
- STEREISPORITES ANTIQUASPORITES
- STEREISPORITES REGIUM
- TRICOLPITES GILLII
- TRICOLPITES PHILLIPSII

2545-50 METERS (DITCH SAMPLE)

AGE : EARLY PALEOCENE
RD2

ENVIRONMENT : NON-MARGINAL MARINE

FIGURE 3. BIOSTRATIGRAPHY OF TURRUM-4, TURRUM RESERVOIR

FAUNA & FLORA : SANDSTONE

PRESERVATION : V POOR-FAIR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN
DINOFLAGELLATES
APECTODINIUM SP. CF. A. SPP.
GLAPHYROCYSTA RETIINTEXTA
PALAEOCYSTODINIUM GOLZOWENSE
SENEGALINIUM DILWYNENSIS
SPINIDINIUM SP. CF. S. DENSISPINATUM
SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
CYATHIDITES SPP.
LAEVIGATOSPORITES SPP.
LYGISTEPOLLENITES BALMEI
LYGISTEPOLLENITES FLORINII
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES MICROSACCATUS
PROTEACIDITES SP. CF. P. ANGULALTUS
PROTEACIDITES SPP.
STEREISPORITES (TRIPUNCTISPORIS) SP.
STEREISPORITES ANTIQUASPORITES

2560-65 METERS (DITCH SAMPLE)

AGE : EARLY PALEOCENE
RD2

ENVIRONMENT : MARGINAL MARINE-MARINE

PRESERVATION : POOR-FAIR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN
DINOFLAGELLATES

FIGURE 3. BIOSTRATIGRAPHY OF TURRUM-4, TURRUM RESERVOIR

ALISOCYSTA CIRCUMTABULATA
APECTODINIUM SP. CF. A. SPP.
CERODINIUM SP. CF. C. SPECIOSUM
DEFLANDREA SPP.
GLAPHYROCYSTA RETIINTEXTA
GLAPHYROCYSTA SPP.
PALAEOCYSTODINIUM GOLZOWENSE
PALAEOPERIDINIUM SP. CF. P. PYROPHORUM
SENEGALINIUM DILWYNENSIS
SPINIDINIUM SP. CF. S. DENSISPINATUM
SPINIDINIUM ESSOI
SPINIDINIUM SPP.
SPINIFERITES SPP.
SYSTEMATOPHORA SP. CF. S. SPP.
TURBIOSPHAERA FILOSA
UNDIFFERENTIATED FORMS
VOZZHENNIKOVIA ANGULATA
VOZZHENNIKOVIA APERTURA
VOZZHENNIKOVIA SPP.

SPORES AND POLLEN

AUSTALOPOLLIS OBSCURUS
BACULATISPORITES SPP.
CYATHIDITES SPP.
GLEICHENIIDITES SPP.
LAEVIGATOSPORITES SPP.
LYGISTEPOLLENITES BALMEI
LYGISTEPOLLENITES FLORINII
NOTHOFAGIDITES ENDURUS
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES MICROSACCATUS
POLYPORATE
PROTEACIDITES SPP.
STEREISPORITES (TRIPUNCTISPORIS) SP.
STEREISPORITES ANTIQUASPORITES

2580-85 METERS (DITCH SAMPLE)

AGE : EARLY PALEOCENE
RE1

ENVIRONMENT : MARINE

FAUNA & FLORA : FLOOD DINOS

PRESERVATION : V POOR-FAIR

SPECIES: OTHER

AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL

FIGURE 3. BIOSTRATIGRAPHY OF TURRUM-4, TURRUM RESERVOIR

DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN

DINOFLAGELLATES
CERODINIUM SP. CF. C. SPECIOSUM
CERODINIUM SPP.
CERODINIUM SP. CF. C. STRIATUM
DEFLANDREA SPP.
GLAPHYROCYSTA SPP.
HAFNIASPHAERA SP.
HYSTRICHOSPHAERIDIUM SPP.
OPERCULODINIUM CENTROCARPUM
PALAEOCYSTODINIUM GOLZOWENSE
SENEGALINIUM DILWYNENSIS
SPINIDINIUM DENSISPINATUM
SPINIDINIUM ESSOI
SPINIDINIUM SP. CF. S. MACMURDOENSE
SPINIDINIUM SPP.
SPINIFERITES SPP.
TURBIOSPHAERA FILOSA
UNDIFFERENTIATED FORMS
VOZZHENNIKOVIA ANGULATA
VOZZHENNIKOVIA APERTURA
VOZZHENNIKOVIA SPP.

SPORES AND POLLEN
LYGISTEPOLLENITES BALMEI
LYGISTEPOLLENITES FLORINII
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PROTEACIDITES ANGULALTUS
PROTEACIDITES SPP.

2585 METERS (SIDE-WALL CORE)

AGE : EARLY PALEOCENE
RE1

ENVIRONMENT : MARINE

FAUNA & FLORA : DINO FLOOD

PRESERVATION : FAIR-GOOD

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (SPORE-POLLEN)

FIGURE 3. BIOSTRATIGRAPHY OF TURRUM-4, TURRUM RESERVOIR

INDETERMINATE FINES
WOODY-COALY KEROGEN
DINOFLAGELLATES
ALISOCYSTA CIRCUMTABULATA
CERODINIUM SP. CF. C. SPECIOSUM
CERODINIUM SPP.
DEFLANDREA SPP.
GLAPHYROCYSTA SPP.
HAFNIASPHAERA SP.
OPERCULODINIUM CENTROCARPUM
PALAEOCYSTODINIUM GOLZOWENSE
SENEGALINIUM DILWYNENSIS
SPINIDINIUM DENSISPINATUM
SPINIDINIUM ESSOI
SPINIDINIUM SP. CF. S. MACMURDOENSE
SPINIDINIUM SPP.
SPINIFERITES SPP.
TURBIOSPHAERA FILOSA
UNDIFFERENTIATED FORMS
VOZZHENNIKOVIA ANGULATA
VOZZHENNIKOVIA APERTURA
VOZZHENNIKOVIA SPP.
SPORES AND POLLEN
LYGISTEPOLLENITES BALMEI
LYGISTEPOLLENITES FLORINII
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PROTEACIDITES ANGULALTUS
PROTEACIDITES SPP.

2591.5 METERS (SIDE-WALL CORE)

AGE : EARLY PALEOCENE
RE1

ENVIRONMENT : NONMARINE

FAUNA & FLORA : COAL, RARE S/P

PRESERVATION : FAIR-POOR

SPECIES: OTHER
BIODEGRADED TERRESTRIAL
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
WOODY-COALY KEROGEN
SPORES AND POLLEN
CYATHAEIDITES GIGANTIS
GLEICHENIIDITES SPP.

FIGURE 3. BIOSTRATIGRAPHY OF TURRUM-4, TURRUM RESERVOIR

LATROBOSPORITES OHAIENSIS
MILFORDIA SPP.
PERIPOROPOLLENITES POLYPORATUS
PHYLLOCLADIDITES MAWSONII FORM VERRUCOSUS
PODOCARPIDITES SPP.
PROTEACIDITES SPP.
STEREISPORITES ANTIQUASPORITES

2600-5 METERS (DITCH SAMPLE)

AGE : EARLY PALEOCENE
RE1

ENVIRONMENT : MARGINAL MARINE-MARINE

FAUNA & FLORA : SOME CAVINGS

PRESERVATION : V POOR-FAIR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN

DINOFLAGELLATES
APECTODINIUM SP. CF. A. SPP.
CERODINIUM SP. CF. C. SPECIOSUM
DEFLANDREA SPP.
SENEGALINIUM DILWYNENSIS
SPINIDINIUM DENSISPINATUM
TURBIOSPHAERA FILOSA
VOZZHENNIKOVIA ANGULATA
VOZZHENNIKOVIA APERTURA
VOZZHENNIKOVIA SPP.

SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
CYATHIDITES SPP.
LYGISTEPOLLENITES BALMEI
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PROTEACIDITES SPP.
STEREISPORITES ANTIQUASPORITES

2610-15 METERS (DITCH SAMPLE)

FIGURE 3. BIOSTRATIGRAPHY OF TURRUM-4, TURRUM RESERVOIR

AGE : EARLY PALEOCENE
RE1

ENVIRONMENT : MARGINAL MARINE-MARINE

PRESERVATION : V POOR-FAIR

SPECIES: OTHER
- AMORPHOUS KEROGEN
- BIODEGRADED TERRESTRIAL
- DINOFLAGELLATES-ACRITARCHS
- HERBACEOUS KEROGEN (CUTICLE)
- HERBACEOUS KEROGEN (SPORE-POLLEN)
- INDETERMINATE FINES
- WOODY-COALY KEROGEN

DINOFLAGELLATES
- APECTODINIUM SP. CF. A. SPP.
- CERODINIUM SP. CF. C. SPECIOSUM
- DEFLANDREA SPP.
- OPERCULODINIUM CENTROCARPUM
- PALAEOCYSTODINIUM GOLZOWENSE
- PALAEOPERIDINIUM SP. CF. P. PYROPHORUM
- SENEGALINIUM DILWYNENSIS
- SPINIDINIUM DENSISPINATUM
- SPINIDINIUM SPP.
- SPINIFERITES SPP.
- TURBIOSPHAERA FILOSA
- VOZZHENNIKOVIA ANGULATA
- VOZZHENNIKOVIA SPP.

SPORES AND POLLEN
- AUSTALOPOLLIS OBSCURUS
- BACULATISPORITES SPP.
- LAEVIGATOSPORITES SPP.
- LYGISTEPOLLENITES BALMEI
- PODOCARPIDITES SPP.
- PODOSPORITES ANTARCTICUS
- PODOSPORITES MICROSACCATUS
- PROTEACIDITES SPP.
- STEREISPORITES (TRIPUNCTISPORIS) SP.
- STEREISPORITES ANTIQUASPORITES
- TRICOLPITES GILLII

2623.0 METERS (SIDE-WALL CORE)

AGE : EARLY PALEOCENE
RE1

ENVIRONMENT : MARGINAL MARINE-MARINE

PRESERVATION : V POOR-FAIR

FIGURE 3. BIOSTRATIGRAPHY OF TURRUM-4, TURRUM RESERVOIR

SPECIES: OTHER
- AMORPHOUS KEROGEN
- BIODEGRADED TERRESTRIAL
- DINOFLAGELLATES-ACRITARCHS
- HERBACEOUS KEROGEN (CUTICLE)
- HERBACEOUS KEROGEN (SPORE-POLLEN)
- INDETERMINATE FINES
- WOODY-COALY KEROGEN

DINOFLAGELLATES
- APECTODINIUM SP. CF. A. SPP.
- CERODINIUM SP. CF. C. SPECIOSUM
- CERODINIUM SP. CF. C. STRIATUM
- DEFLANDREA SPP.
- OPERCULODINIUM SP. CF. O. CENTROCARPUM
- SPINIDINIUM DENSISPINATUM
- SPINIDINIUM ESSOI
- SPINIDINIUM SPP.
- SPINIFERITES SPP.
- TURBIOSPHAERA FILOSA
- UNDIFFERENTIATED FORMS
- VOZZHENNIKOVIA ANGULATA
- VOZZHENNIKOVIA APERTURA
- VOZZHENNIKOVIA SP. CF. V. ECHINOIDEA

SPORES AND POLLEN
- AUSTALOPOLLIS OBSCURUS
- CYATHIDITES SPP.
- DILWYNITES GRANULATUS
- GAMBIERINA RUDATA
- GLEICHENIIDITES SPP.
- LYGISTEPOLLENITES BALMEI
- NOTHOFAGIDITES ENDURUS
- PHYLLOCLADIDITES MAWSONII
- PHYLLOCLADIDITES RETICULOSACCATUS
- PODOCARPIDITES SPP.
- PODOSPORITES ANTARCTICUS
- PODOSPORITES MICROSACCATUS
- PROTEACIDITES SPP.
- STEREISPORITES ANTIQUASPORITES
- TRICOLPITES GILLII
- TRICOLPITES PHILLIPSII
- VERRUCATOSPORITES SP. 3

2630-35 METERS (DITCH SAMPLE)

AGE : EARLY PALEOCENE
RE2

ENVIRONMENT : MARGINAL MARINE-MARINE

PRESERVATION : V POOR-FAIR

FIGURE 3. BIOSTRATIGRAPHY OF TURRUM-4, TURRUM RESERVOIR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN
DINOFLAGELLATES
APECTODINIUM SP. CF. A. SPP.
CERODINIUM SP. CF. C. SPECIOSUM
HAFNIASPHAERA SP.
SPINIDINIUM DENSISPINATUM
SPINIDINIUM ESSOI
SPINIDINIUM SPP.
SPINIFERITES SPP.
TRITHYRODINIUM EVITTII
TURBIOSPHAERA FILOSA
VOZZHENNIKOVIA ANGULATA
VOZZHENNIKOVIA APERTURA
VOZZHENNIKOVIA SP. CF. V. ECHINOIDEA
SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
CYATHIDITES SPP.
GLEICHENIIDITES SPP.
LAEVIGATOSPORITES SPP.
LYGISTEPOLLENITES BALMEI
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PODOSPORITES MICROSACCATUS
PROTEACIDITES SPP.

2655-60 METERS (DITCH SAMPLE)

AGE : E. E. PALEOC.-?LT. MAAST.
RF

ENVIRONMENT : NON-MARGINAL MARINE

PRESERVATION : FAIR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN
DINOFLAGELLATES

FIGURE 3. BIOSTRATIGRAPHY OF TURRUM-4, TURRUM RESERVOIR

CERODINIUM SP. CF. C. SPECIOSUM
DEFLANDREA SPP.
SPINIDINIUM DENSISPINATUM
SPINIDINIUM ESSOI
SPINIDINIUM SPP.

SPORES AND POLLEN
ARAUCARIACITES AUSTRALIS
AUSTALOPOLLIS OBSCURUS
BACULATISPORITES SPP.
CYATHIDITES SPP.
GLEICHENIIDITES SPP.
LAEVIGATOSPORITES SPP.
LYGISTEPOLLENITES BALMEI
LYGISTEPOLLENITES FLORINII
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PODOSPORITES MICROSACCATUS
PROTEACIDITES ANGULALTUS
PROTEACIDITES SPP.
STEREISPORITES (TRIPUNCTISPORIS) SP.
STEREISPORITES ANTIQUASPORITES
TRICOLPITES CONFESSUS
TRICOLPITES SP. CF. T. CONFESSUS
TRICOLPITES GILLII
TRICOLPITES PHILLIPSII
TRICOLPITES SPP.

2657.0 METERS (SIDE-WALL CORE)

AGE : E. E. PALEOC.-?LT. MAAST.
RF

ENVIRONMENT : MARGINAL MARINE

PRESERVATION : POOR

SPECIES: OTHER
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
WOODY-COALY KEROGEN

DINOFLAGELLATES
CERODINIUM SP. CF. C. SPECIOSUM
DEFLANDREA SPP.
ISABELIDINIUM SP. CF. I. BAKERI
SENEGALINIUM DILWYNENSIS
SPINIDINIUM DENSISPINATUM
SPINIDINIUM SPP.

FIGURE 3. BIOSTRATIGRAPHY OF TURRUM-4, TURRUM RESERVOIR

UNDIFFERENTIATED FORMS
SPORES AND POLLEN
ARAUCARIACITES AUSTRALIS
AUSTALOPOLLIS OBSCURUS
CYATHIDITES SPP.
DILWYNITES GRANULATUS
GLEICHENIIDITES SPP.
HERKOSPORITES ELLIOTII
LAEVIGATOSPORITES SPP.
LATROBOSPORITES OHAIENSIS
LYGISTEPOLLENITES BALMEI
LYGISTEPOLLENITES FLORINII
NOTHOFAGIDITES ENDURUS
PHYLLOCLADIDITES MAWSONII
PHYLLOCLADIDITES MAWSONII FORM VERRUCOSUS
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PODOSPORITES MICROSACCATUS
PROTEACIDITES ANGULALTUS
PROTEACIDITES MINUTUS
PROTEACIDITES SPP.
STEREISPORITES (TRIPUNCTISPORIS) SP.
STEREISPORITES ANTIQUASPORITES
STEREISPORITES REGIUM
TRICOLPITES SP. CF. T. CONFESSUS
TRICOLPITES GILLII

2665-70 METERS (DITCH SAMPLE)

AGE : E. E. PALEOC.-?LT. MAAST.
RF

ENVIRONMENT : NONMARINE

PRESERVATION : V POOR-FAIR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN
SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
CYATHIDITES SPP.
GLEICHENIIDITES SPP.
LAEVIGATOSPORITES SPP.
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.

FIGURE 3. BIOSTRATIGRAPHY OF TURRUM-4, TURRUM RESERVOIR

PODOSPORITES MICROSACCATUS
PROTEACIDITES SPP.
STEREISPORITES (TRIPUNCTISPORIS) SP.
STEREISPORITES ANTIQUASPORITES
TRICOLPITES CONFESSUS
TRICOLPITES GILLII

2690-95 METERS (DITCH SAMPLE)

AGE : E. E. PALEOC.-?LT. MAAST.
RF

ENVIRONMENT : NON-MARGINAL MARINE

PRESERVATION : POOR-FAIR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN
DINOFLAGELLATES
SPINIDINIUM DENSISPINATUM
SPINIDINIUM SPP.
UNDIFFERENTIATED FORMS
SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
CYATHIDITES SPP.
EPHEDRIPITES SPP.
GLEICHENIIDITES SPP.
HALORAGACIDITES HARRISII
LAEVIGATOSPORITES SPP.
LILIACIDITES SPP.
LYGISTEPOLLENITES BALMEI
LYGISTEPOLLENITES FLORINII
NOTHOFAGIDITES ENDURUS
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PODOSPORITES MICROSACCATUS
PROTEACIDITES ANGULALTUS
PROTEACIDITES SPP.
STEREISPORITES (TRIPUNCTISPORIS) SP.
STEREISPORITES ANTIQUASPORITES
STEREISPORITES REGIUM
TRICOLPITES CONFESSUS
TRICOLPITES GILLII

FIGURE 3. BIOSTRATIGRAPHY OF TURRUM-4, TURRUM RESERVOIR

TRICOLPITES SPP.

2696.0 METERS (SIDE-WALL CORE)

AGE : E. E. PALEOC.-?LT. MAAST.
RF

ENVIRONMENT : NON-MARGINAL MARINE

PRESERVATION : POOR

SPECIES: OTHER
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
WOODY-COALY KEROGEN
DINOFLAGELLATES
DEFLANDREA SPP.
SPINIDINIUM SP. CF. S. ESSOI
SPINIDINIUM SPP.
UNDIFFERENTIATED FORMS
SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
CAMAROZONOSPORITES SPP.
CYATHAEIDITES GIGANTIS
EPHEDRIPITES NOTENSIS
EPHEDRIPITES SPP.
GLEICHENIIDITES SPP.
HERKOSPORITES ELLIOTII
LAEVIGATOSPORITES SPP.
LYGISTEPOLLENITES BALMEI
LYGISTEPOLLENITES FLORINII
PEROMONOLETES DENSUS
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES MICROSACCATUS
PROTEACIDITES ANGULALTUS
PROTEACIDITES MINUTUS
PROTEACIDITES SPP.
STEREISPORITES (TRIPUNCTISPORIS) SP.
STEREISPORITES ANTIQUASPORITES
TETRACOLPORITES VERRUCOSUS

2700-5 METERS (DITCH SAMPLE)

AGE : E. E. PALEOC.-?LT. MAAST.

FIGURE 3. BIOSTRATIGRAPHY OF TURRUM-4, TURRUM RESERVOIR

RF

ENVIRONMENT : NON-MARGINAL MARINE

PRESERVATION : POOR-FAIR

SPECIES: OTHER
- AMORPHOUS KEROGEN
- BIODEGRADED TERRESTRIAL
- DINOFLAGELLATES-ACRITARCHS
- HERBACEOUS KEROGEN (CUTICLE)
- HERBACEOUS KEROGEN (SPORE-POLLEN)
- INDETERMINATE FINES
- WOODY-COALY KEROGEN

DINOFLAGELLATES
- SPINIDINIUM SPP.
- UNDIFFERENTIATED FORMS

SPORES AND POLLEN
- AUSTALOPOLLIS OBSCURUS
- CYATHIDITES SPP.
- EPHEDRIPITES NOTENSIS
- EPHEDRIPITES SPP.
- GAMBIERINA RUDATA
- GLEICHENIIDITES SPP.
- HALORAGACIDITES HARRISII
- HERKOSPORITES ELLIOTII
- LAEVIGATOSPORITES SPP.
- LILIACIDITES SPP.
- PHYLLOCLADIDITES MAWSONII
- PODOCARPIDITES SPP.
- PODOSPORITES MICROSACCATUS
- PROTEACIDITES ANGULALTUS
- PROTEACIDITES SPP.
- STEREISPORITES ANTIQUASPORITES
- TRICOLPITES SP. CF. T. CONFESSUS
- TRICOLPITES GILLII
- TRICOLPITES SPP.
- TRICOLPORITES SPP.

2703.0 METERS (SIDE-WALL CORE)

AGE : E. E. PALEOC.-?LT. MAAST.
RF

ENVIRONMENT : NONMARINE

FAUNA & FLORA : COAL, ABUN LEAF/HERB TISSUE

PRESERVATION : POOR

FIGURE 3. BIOSTRATIGRAPHY OF TURRUM-4, TURRUM RESERVOIR

SPECIES: OTHER
BIODEGRADED TERRESTRIAL
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
WOODY-COALY KEROGEN
SPORES AND POLLEN
CYATHAEIDITES GIGANTIS
GLEICHENIIDITES SPP.
PHYLLOCLADIDITES MAWSONII
PROTEACIDITES SPP.
STEREISPORITES ANTIQUASPORITES

2710-15 METERS (DITCH SAMPLE)

AGE : E. E. PALEOC.-?LT. MAAST.
RF

ENVIRONMENT : NONMARINE

FAUNA & FLORA : SOME CAVED FORMS

PRESERVATION : POOR-FAIR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN
SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
CYATHIDITES SPP.
GLEICHENIIDITES SPP.
LAEVIGATOSPORITES SPP.
LILIACIDITES SPP.
LYGISTEPOLLENITES BALMEI
LYGISTEPOLLENITES FLORINII
NOTHOFAGIDITES EMARCUDUS/HETERUS
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PODOSPORITES MICROSACCATUS
PROTEACIDITES ANGULALTUS
PROTEACIDITES SPP.
STEREISPORITES (TRIPUNCTISPORIS) SP.
STEREISPORITES ANTIQUASPORITES
TRICOLPITES CONFESSUS
TRICOLPITES GILLII
TRICOLPITES SPP.

FIGURE 3. BIOSTRATIGRAPHY OF TURRUM-4, TURRUM RESERVOIR

TRICOLPORITES SPP.

2716.0 METERS (SIDE-WALL CORE)

AGE : E. E. PALEOC.-?LT. MAAST.
RF

ENVIRONMENT : MARINE-MARGINAL MARINE

FAUNA & FLORA : COMM PYRITE CRYST, R REWKD

PRESERVATION : POOR

SPECIES: OTHER
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (SPORE-POLLEN)
WOODY-COALY KEROGEN

DINOFLAGELLATES
DEFLANDREA SPP.
MICRHYSTRIDIUM SP. CF. M. FRAGILE
SENEGALINIUM? DILWYNENSE
SPINIDINIUM SP. CF. S. DENSISPINATUM
SPINIDINIUM SPP.
SPINIFERITES RAMOSUS
SPINIFERITES RAMOSUS MULTIBREVIS
SPINIFERITES SPP.

SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
CERATOSPORITES EQUALIS
CYATHAEIDITES GIGANTIS
DILWYNITES TUBERCULATUS
EPHEDRIPITES NOTENSIS
GAMBIERINA RUDATA
GLEICHENIIDITES SPP.
HERKOSPORITES ELLIOTII
LAEVIGATOSPORITES SPP.
LATROBOSPORITES CRASSUS
LATROBOSPORITES OHAIENSIS
LYGISTEPOLLENITES BALMEI
LYGISTEPOLLENITES FLORINII
NOTHOFAGIDITES BRACHYSPINULOSUS
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PODOSPORITES MICROSACCATUS
PROTEACIDITES ANGULALTUS
PROTEACIDITES MINUTUS
PROTEACIDITES SPP.
PROTEACIDITES SP. CF. P. TUBERCULOTUMULA

FIGURE 3. BIOSTRATIGRAPHY OF TURRUM-4, TURRUM RESERVOIR

RUGULATISPORITES MALLATUS
STEREISPORITES (TRIPUNCTISPORIS) SP.
STEREISPORITES ANTIQUASPORITES
STEREISPORITES REGIUM
STYXISPORITES MORGANII
TETRACOLPORITES VERRUCOSUS
TRICOLPITES CONFESSUS
TRICOLPITES GILLII
TRICOLPITES SPP.
TRIORITES SPP.

2720-25 METERS (DITCH SAMPLE)

AGE : E. E. PALEOC.-?LT. MAAST.
RF

ENVIRONMENT : NON-MARGINAL MARINE

PRESERVATION : POOR-FAIR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
WOODY-COALY KEROGEN
DINOFLAGELLATES
GLAPHYROCYSTA SPP.
SPINIDINIUM DENSISPINATUM
SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
GLEICHENIIDITES SPP.
LYGISTEPOLLENITES BALMEI
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PODOSPORITES MICROSACCATUS
PROTEACIDITES SPP.
STEREISPORITES ANTIQUASPORITES
TRICOLPITES GILLII
TRICOLPITES SPP.

2726.0 METERS (SIDE-WALL CORE)

AGE : INDETERMINATE

FIGURE 3. BIOSTRATIGRAPHY OF TURRUM-4, TURRUM RESERVOIR

ENVIRONMENT : NONMARINE

FAUNA & FLORA : COAL

PRESERVATION : POOR

SPECIES: OTHER
BIODEGRADED TERRESTRIAL
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
WOODY-COALY KEROGEN

SPORES AND POLLEN
GLEICHENIIDITES SPP.
HALORAGACIDITES SP. CF. H. HARRISII
JUXTACOLPUS SP. CF. J. PIERATUS
LATROBOSPORITES CRASSUS
LYGISTEPOLLENITES FLORINII
NOTHOFAGIDITES SPP.
PHYLLOCLADIDITES MAWSONII
PROTEACIDITES SP. CF. P. ANGULALTUS
PROTEACIDITES SPP.
STEREISPORITES ANTIQUASPORITES
STEREISPORITES SPP.
TRICOLPITES SP. CF. T. PHILLIPSII
TRIORITES SPP.

2750-55 METERS (DITCH SAMPLE)

AGE : PROB. L. MAASTRICHTIAN
RG

ENVIRONMENT : MARGINAL MARINE-MARINE

FAUNA & FLORA : SOME CAVINGS, INCL A.HOMO.

PRESERVATION : POOR-V POOR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN

DINOFLAGELLATES
CERODINIUM SP. CF. C. SPECIOSUM
CYCLOPSIELLA SPP.
DEFLANDREA SP. CF. D. SP.
DEFLANDREA SPP.

FIGURE 3. BIOSTRATIGRAPHY OF TURRUM-4, TURRUM RESERVOIR

GLAPHYROCYSTA RETIINTEXTA
HYSTRICHOSPHAERIDIUM SPP.
SENEGALINIUM SP. CF. S. DILWYNENSIS
SPINIDINIUM DENSISPINATUM
UNDIFFERENTIATED FORMS

SPORES AND POLLEN

AUSTALOPOLLIS OBSCURUS
CYATHIDITES SPP.
GLEICHENIIDITES SPP.
LILIACIDITES SPP.
LYGISTEPOLLENITES BALMEI
LYGISTEPOLLENITES FLORINII
NOTHOFAGIDITES EMARCUDUS/HETERUS
NOTHOFAGIDITES ENDURUS
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PODOSPORITES MICROSACCATUS
PROTEACIDITES ANGULALTUS
PROTEACIDITES SPP.
STEREISPORITES ANTIQUASPORITES
TETRACOLPORITES VERRUCOSUS
TRICOLPITES CONFESSUS
TRICOLPITES GILLII
TRICOLPITES SPP.
TRICOLPORITES SPP.

2776.6 METERS (DITCH SAMPLE)

AGE : PROB. L. MAASTRICHTIAN
RG

ENVIRONMENT : NONMARINE

PRESERVATION : POOR-FAIR

SPECIES: OTHER

AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN

DINOFLAGELLATES

APECTODINIUM SP. CF. A. SPP.
CERODINIUM SP. CF. C. SPECIOSUM
CYCLOPSIELLA SPP.
DEFLANDREA SP. CF. D. SP.
HAFNIASPHAERA SP.

FIGURE 3. BIOSTRATIGRAPHY OF TURRUM-4, TURRUM RESERVOIR

PALAEOPERIDINIUM PYROPHORUM
SPINIDINIUM DENSISPINATUM
SPINIFERITES SPP.
TURBIOSPHAERA FILOSA
VOZZHENNIKOVIA SP. CF. V. ECHINOIDEA
VOZZHENNIKOVIA SPP.

SPORES AND POLLEN

AUSTALOPOLLIS OBSCURUS
CYATHIDITES SPP.
GLEICHENIIDITES SPP.
LAEVIGATOSPORITES SPP.
LYGISTEPOLLENITES BALMEI
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES MICROSACCATUS
PROTEACIDITES AMOLOSEXINUS
PROTEACIDITES SPP.
STEREISPORITES ANTIQUASPORITES
TRICOLPITES GILLII
TRICOLPITES SPP.

APPENDIX C

Age Summary and Data

FIGURE 4. BIOSTRATIGRAPHY OF TURRUM-3, TURRUM RESERVOIR

A G E S U M M A R Y

(DEPTH IN METERS)

NO SAMPLES ABOVE A DEPTH OF 2034.0 METERS

2034.0	EARLY EOCENE SZ
2125-30	LATE PALEOCENE RA
2155-60	LATE PALEOCENE RB
2175-80	LATE PALEOCENE RB-?RC
2194.9	E. LATE PALEOCENE RC?
2215-20	E. LATE PALEOCENE RC
2280-85	L. EARLY PALEOCENE? RD1?
2305-10	L. EARLY PALEOCENE RD1
2365-70	L. EARLY PALEOCENE RD1?
2370-75	EARLY PALEOCENE RD2
2415-20	EARLY PALEOCENE RE1
2465-70	EARLY PALEOCENE RE2
2475-80	E. E. PALEOC.-?LT. MAAST.? RF?
2485-90	E. E. PALEOC.-?LT. MAAST. RF
2560-65	E. E. PALEOC.-?LT. MAAST.? RF?

FIGURE 4. BIOSTRATIGRAPHY OF TURRUM-3, TURRUM RESERVOIR

A G E S U M M A R Y - C O N T I N U E D

(DEPTH IN METERS)

2614.0	PROB. L. MAASTRICHTIAN? RG?
2645-50	PROB. L. MAASTRICHTIAN RG
2700-5	LATE MAASTRICHTIAN MA
2710-15	LATE MAASTRICHTIAN? MA?
2805-10	BOTTOM WELL SAMPLE EXAMINED

FIGURE 4. BIOSTRATIGRAPHY OF TURRUM-3, TURRUM RESERVOIR

E N V I R O N M E N T S U M M A R Y

(DEPTH IN METERS)

NO SAMPLES ABOVE A DEPTH OF 2034.0 METERS

2034.0	MARGINAL MARINE
2194.9	MARINE
2195-2200	MARINE-MARGINAL MARINE
2280-85	MARINE
2365-70	MARGINAL-NONMARINE
2370-75	NONMARINE
2415-20	MARINE
2440-45	MARGINAL MARINE?
2445-50	MARGINAL MARINE?-NONMARINE
2465-70	MARGINAL MARINE-MARINE
2475-80	NONMARINE
2485-90	MARGINAL-NONMARINE
2525-30	NONMARINE
2580-85	NONMARINE-MARGINAL MARINE
2614.0	MARINE
2615-18	MARGINAL MARINE
2647.0	MARINE
2700-5	MARGINAL MARINE
2710-15	PROB NONMARINE
2755-60	MARGINAL MARINE
2805-10	BOTTOM WELL SAMPLE EXAMINED

FIGURE 4. BIOSTRATIGRAPHY OF TURRUM-3, TURRUM RESERVOIR

2034.0 METERS (SIDE-WALL CORE)

AGE : EARLY EOCENE
SZ

ENVIRONMENT : MARGINAL MARINE

FAUNA & FLORA : COMM PYRITE SCARS

PRESERVATION : POOR-FAIR

SPECIES: OTHER
- AMORPHOUS KEROGEN
- BIODEGRADED TERRESTRIAL
- DINOFLAGELLATES-ACRITARCHS
- HERBACEOUS KEROGEN (CUTICLE)
- HERBACEOUS KEROGEN (SPORE-POLLEN)
- INDETERMINATE FINES
- WOODY-COALY KEROGEN

DINOFLAGELLATES
- APECTODINIUM HOMOMORPHUM
- OPERCULODINIUM CENTROCARPUM

SPORES AND POLLEN
- AUSTALOPOLLIS OBSCURUS
- CYATHIDITES SPP.
- DILWYNITES GRANULATUS
- DILWYNITES TUBERCULATUS
- GAMBIERINA RUDATA
- GLEICHENIIDITES SPP.
- HALORAGACIDITES HARRISII
- HERKOSPORITES ELLIOTII
- LAEVIGATOSPORITES SPP.
- LATROBOSPORITES CRASSUS
- LYGISTEPOLLENITES BALMEI
- LYGISTEPOLLENITES FLORINII
- NOTHOFAGIDITES BRACHYSPINULOSUS
- NOTHOFAGIDITES EMARCUDUS/HETERUS
- NOTHOFAGIDITES ENDURUS
- PHYLLOCLADIDITES MAWSONII
- PODOCARPIDITES SPP.
- PODOSPORITES ANTARCTICUS
- PODOSPORITES MICROSACCATUS
- POLYCOLPITES LANGSTONII
- PROTEACIDITES ADENANTHOIDES
- PROTEACIDITES SP. CF. P. ANGULALTUS
- PROTEACIDITES ANNULARIS
- PROTEACIDITES SPP.
- STEREISPORITES (TRIPUNCTISPORIS) SP.
- STEREISPORITES ANTIQUASPORITES
- TRICOLPITES GILLII
- TRICOLPITES PHILLIPSII

FIGURE 4. BIOSTRATIGRAPHY OF TURRUM-3, TURRUM RESERVOIR

2125-30 METERS (DITCH SAMPLE)

AGE : LATE PALEOCENE
RA

ENVIRONMENT : MARGINAL MARINE

PRESERVATION : POOR-FAIR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN
DINOFLAGELLATES
APECTODINIUM SP. CF. A. SPP.
CLEISTOSPHAERIDIUM SPP.
CYCLOPSIELLA SPP.
DEFLANDREA MEDCALFII
DEFLANDREA SPP.
SENEGALINIUM DILWYNENSIS
UNDIFFERENTIATED FORMS
SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
CYATHIDITES SPP.
GLEICHENIIDITES SPP.
LAEVIGATOSPORITES SPP.
NOTHOFAGIDITES ENDURUS
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PODOSPORITES MICROSACCATUS
PROTEACIDITES SPP.
STEREISPORITES (TRIPUNCTISPORIS) SP.
STEREISPORITES ANTIQUASPORITES

2127 METERS (SIDE-WALL CORE)

AGE : LATE PALEOCENE
RA

ENVIRONMENT : MARGINAL MARINE

PRESERVATION : POOR-FAIR

SPECIES: OTHER
AMORPHOUS KEROGEN

FIGURE 4. BIOSTRATIGRAPHY OF TURRUM-3, TURRUM RESERVOIR

BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN

DINOFLAGELLATES
APECTODINIUM SP. CF. A. SPP.
CYCLOPSIELLA SPP.
SENEGALINIUM DILWYNENSIS

SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
DILWYNITES GRANULATUS
DILWYNITES TUBERCULATUS
GLEICHENIIDITES SPP.
LAEVIGATOSPORITES SPP.
LYGISTEPOLLENITES BALMEI
NOTHOFAGIDITES ENDURUS
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PROTEACIDITES ANGULALTUS
PROTEACIDITES SPP.
RUGULATISPORITES MALLATUS
STEREISPORITES (TRIPUNCTISPORIS) SP.
STEREISPORITES ANTIQUASPORITES

2135-40 METERS (DITCH SAMPLE)

AGE : LATE PALEOCENE
RA

ENVIRONMENT : MARGINAL MARINE

PRESERVATION : POOR-FAIR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
WOODY-COALY KEROGEN

DINOFLAGELLATES
APECTODINIUM SP. CF. A. SPP.
SENEGALINIUM DILWYNENSIS

SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
GLEICHENIIDITES SPP.
LAEVIGATOSPORITES SPP.
LYGISTEPOLLENITES BALMEI

FIGURE 4. BIOSTRATIGRAPHY OF TURRUM-3, TURRUM RESERVOIR

MALVACILPOLLIS DIVERSUS
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PODOSPORITES MICROSACCATUS
PROTEACIDITES SP. CF. P. ANGULALTUS
PROTEACIDITES SPP.
STEREISPORITES (TRIPUNCTISPORIS) SP.
STEREISPORITES ANTIQUASPORITES
STEREISPORITES REGIUM

2155-60 METERS (DITCH SAMPLE)

AGE : LATE PALEOCENE
RB

ENVIRONMENT : MARGINAL MARINE

FAUNA & FLORA : MINOR RC COMPONENT

PRESERVATION : FAIR-POOR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
WOODY-COALY KEROGEN

DINOFLAGELLATES
APECTODINIUM SP. CF. A. SPP.
GLAPHYROCYSTA RETIINTEXTA
GLAPHYROCYSTA SPP.
OPERCULODINIUM CENTROCARPUM
PALAEOCYSTODINIUM AUSTRALINUM
PALAEOCYSTODINIUM GOLZOWENSE
SENEGALINIUM DILWYNENSIS
SPINIFERITES SPP.
SYSTEMATOPHORA SP. CF. S. SP.

SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
BACULATISPORITES SPP.
CLAVIFERA TRIPLEX
GLEICHENIIDITES SPP.
LAEVIGATOSPORITES SPP.
LYGISTEPOLLENITES BALMEI
LYGISTEPOLLENITES FLORINII
NOTHOFAGIDITES BRACHYSPINULOSUS
NOTHOFAGIDITES ENDURUS
PHYLLOCLADIDITES MAWSONII

FIGURE 4. BIOSTRATIGRAPHY OF TURRUM-3, TURRUM RESERVOIR

PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PODOSPORITES MICROSACCATUS
PROTEACIDITES ANNULARIS
PROTEACIDITES SPP.
STEREISPORITES (TRIPUNCTISPORIS) SP.
STEREISPORITES ANTIQUASPORITES

2157 METERS (SIDE-WALL CORE)

AGE : LATE PALEOCENE
RB

ENVIRONMENT : MARGINAL MARINE

PRESERVATION : FAIR-POOR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN

DINOFLAGELLATES
APECTODINIUM SP. CF. A. SPP.
CERODINIUM SP. CF. C. SPECIOSUM
DEFLANDREA SPP.
GLAPHYROCYSTA RETIINTEXTA
GLAPHYROCYSTA SPP.
OPERCULODINIUM CENTROCARPUM
PARALECANIELLA INDENTATA
SENEGALINIUM DILWYNENSIS
SPINIFERITES SPP.
UNDIFFERENTIATED FORMS

SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
BACULATISPORITES SPP.
CLAVIFERA TRIPLEX
CYATHIDITES SPP.
ERICIPITES SCABRATUS
GAMBIERINA EDWARSII
GAMBIERINA RUDATA
GLEICHENIIDITES SPP.
HALORAGACIDITES HARRISII
HERKOSPORITES ELLIOTII
LAEVIGATOSPORITES SPP.
LYGISTEPOLLENITES BALMEI
LYGISTEPOLLENITES FLORINII

FIGURE 4. BIOSTRATIGRAPHY OF TURRUM-3, TURRUM RESERVOIR

NOTHOFAGIDITES EMARCUDUS/HETERUS
NOTHOFAGIDITES ENDURUS
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PODOSPORITES MICROSACCATUS
PROTEACIDITES LATROBENSIS
PROTEACIDITES SPP.
STEREISPORITES (TRIPUNCTISPORIS) SP.
TRICOLPITES GILLII

2175-80 METERS (DITCH SAMPLE)

AGE : LATE PALEOCENE
RB-?RC

ENVIRONMENT : MARGINAL MARINE

PRESERVATION : FAIR-POOR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN
DINOFLAGELLATES
APECTODINIUM SP. CF. A. SPP.
GLAPHYROCYSTA RETIINTEXTA
GLAPHYROCYSTA SPP.
SENEGALINIUM DILWYNENSIS
SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
GLEICHENIIDITES SPP.
LAEVIGATOSPORITES SPP.
NOTHOFAGIDITES EMARCUDUS/HETERUS
NOTHOFAGIDITES ENDURUS
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PROTEACIDITES SPP.
STEREISPORITES ANTIQUASPORITES

2194.9 METERS (SIDE-WALL CORE)

FIGURE 4. BIOSTRATIGRAPHY OF TURRUM-3, TURRUM RESERVOIR

AGE : E. LATE PALEOCENE
RC?

ENVIRONMENT : MARINE

PRESERVATION : FAIR-POOR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
WOODY-COALY KEROGEN
DINOFLAGELLATES
APECTODINIUM SP. CF. A. SPP.
DEFLANDREA SPP.
SENEGALINIUM DILWYNENSIS
SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
CYATHIDITES SPP.
DILWYNITES GRANULATUS
GAMBIERINA RUDATA
GLEICHENIIDITES SPP.
HALORAGACIDITES HARRISII
HERKOSPORITES ELLIOTII
LAEVIGATOSPORITES SPP.
LYGISTEPOLLENITES BALMEI
LYGISTEPOLLENITES FLORINII
NOTHOFAGIDITES EMARCUDUS/HETERUS
NOTHOFAGIDITES ENDURUS
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PROTEACIDITES ANGULALTUS
PROTEACIDITES SPP.
STEREISPORITES ANTIQUASPORITES
TRICOLPITES GILLII
TRICOLPITES PHILLIPSII

2195-2200 METERS (DITCH SAMPLE)

AGE : E. LATE PALEOCENE
RC?

ENVIRONMENT : MARINE-MARGINAL MARINE

PRESERVATION : FAIR-POOR

SPECIES: OTHER
AMORPHOUS KEROGEN

FIGURE 4. BIOSTRATIGRAPHY OF TURRUM-3, TURRUM RESERVOIR

BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
WOODY-COALY KEROGEN

DINOFLAGELLATES

APECTODINIUM SP. CF. A. SPP.
CERODINIUM SP. CF. C. SPECIOSUM
CLEISTOSPHAERIDIUM SPP.
DEFLANDREA SPP.
GLAPHYROCYSTA RETIINTEXTA
GLAPHYROCYSTA SPP.
HAFNIASPHAERA SP.
PALAEOCYSTODINIUM GOLZOWENSE
SENEGALINIUM DILWYNENSIS
SPINIFERITES SPP.

SPORES AND POLLEN

AUSTALOPOLLIS OBSCURUS
CYATHIDITES SPP.
DILWYNITES GRANULATUS
GLEICHENIIDITES SPP.
LAEVIGATOSPORITES SPP.
LYGISTEPOLLENITES BALMEI
LYGISTEPOLLENITES FLORINII
NOTHOFAGIDITES BRACHYSPINULOSUS
NOTHOFAGIDITES EMARCUDUS/HETERUS
NOTHOFAGIDITES ENDURUS
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PROTEACIDITES ANGULALTUS
PROTEACIDITES SPP.
STEREISPORITES ANTIQUASPORITES

2205-10 METERS (DITCH SAMPLE)

AGE : E. LATE PALEOCENE
RC?

ENVIRONMENT : MARINE-MARGINAL MARINE

PRESERVATION : FAIR-POOR

SPECIES: OTHER

AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
WOODY-COALY KEROGEN

DINOFLAGELLATES

FIGURE 4. BIOSTRATIGRAPHY OF TURRUM-3, TURRUM RESERVOIR

APECTODINIUM HOMOMORPHUM
APECTODINIUM SP. CF. A. SPP.
CERODINIUM SP. CF. C. SPECIOSUM
DEFLANDREA SPP.
GLAPHYROCYSTA RETIINTEXTA
GLAPHYROCYSTA SPP.
SENEGALINIUM DILWYNENSIS

SPORES AND POLLEN

AUSTALOPOLLIS OBSCURUS
BACULATISPORITES SPP.
CYATHIDITES SPP.
DILWYNITES TUBERCULATUS
GLEICHENIIDITES SPP.
LAEVIGATOSPORITES SPP.
LYGISTEPOLLENITES BALMEI
NOTHOFAGIDITES ENDURUS
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PROTEACIDITES SPP.
STEREISPORITES ANTIQUASPORITES

2215-20 METERS (DITCH SAMPLE)

AGE : E. LATE PALEOCENE
RC

ENVIRONMENT : MARINE-MARGINAL MARINE

PRESERVATION : FAIR-POOR

SPECIES: OTHER

AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN

DINOFLAGELLATES

ALISOCYSTA CIRCUMTABULATA
APECTODINIUM HOMOMORPHUM
APECTODINIUM SP. CF. A. SPP.
CERODINIUM SP. CF. C. SPECIOSUM
DEFLANDREA SPP.
GLAPHYROCYSTA RETIINTEXTA
PALAEOCYSTODINIUM AUSTRALINUM
PALAEOCYSTODINIUM GOLZOWENSE
SENEGALINIUM DILWYNENSIS
SPINIFERITES SPP.

FIGURE 4. BIOSTRATIGRAPHY OF TURRUM-3, TURRUM RESERVOIR

SYSTEMATOPHORA SPP.
UNDIFFERENTIATED FORMS

SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
CYATHIDITES SPP.
GLEICHENIIDITES SPP.
LYGISTEPOLLENITES BALMEI
LYGISTEPOLLENITES FLORINII
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PODOSPORITES MICROSACCATUS
PROTEACIDITES SPP.
STEREISPORITES ANTIQUASPORITES

2240-45 METERS (DITCH SAMPLE)

AGE : E. LATE PALEOCENE
RC

ENVIRONMENT : MARINE-MARGINAL MARINE

PRESERVATION : FAIR-POOR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
WOODY-COALY KEROGEN

DINOFLAGELLATES
APECTODINIUM HOMOMORPHUM
APECTODINIUM SP. CF. A. SPP.
CERODINIUM SP. CF. C. SPECIOSUM
DEFLANDREA SPP.
FIBROCYSTA SPP.
GLAPHYROCYSTA RETIINTEXTA
GLAPHYROCYSTA SPP.
ISABELIDINIUM SP. CF. I. BAKERI
ISABELIDINIUM SP.
PALAEOCYSTODINIUM AUSTRALINUM
PALAEOCYSTODINIUM GOLZOWENSE
PARALECANIELLA INDENTATA
SENEGALINIUM DILWYNENSIS
SPINIDINIUM SP. CF. S. DENSISPINATUM

SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
CYATHIDITES SPP.
GLEICHENIIDITES SPP.

FIGURE 4. BIOSTRATIGRAPHY OF TURRUM-3, TURRUM RESERVOIR

LAEVIGATOSPORITES SPP.
LYGISTEPOLLENITES BALMEI
LYGISTEPOLLENITES FLORINII
NOTHOFAGIDITES BRACHYSPINULOSUS
NOTHOFAGIDITES ENDURUS
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PROTEACIDITES ANGULALTUS
PROTEACIDITES SPP.
STEREISPORITES (TRIPUNCTISPORIS) SP.

2261.9 METERS (SIDE-WALL CORE)

AGE : E. LATE PALEOCENE
RC

ENVIRONMENT : MARINE-MARGINAL MARINE

PRESERVATION : FAIR-POOR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN
DINOFLAGELLATES
APECTODINIUM HOMOMORPHUM
APECTODINIUM SP. CF. A. SPP.
DEFLANDREA SPP.
GLAPHYROCYSTA RETIINTEXTA
GLAPHYROCYSTA SPP.
OPERCULODINIUM CENTROCARPUM
PALAEOCYSTODINIUM GOLZOWENSE
SENEGALINIUM DILWYNENSIS
SPINIDINIUM SPP.
SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
CYATHIDITES SPP.
GLEICHENIIDITES SPP.
HERKOSPORITES ELLIOTII
LAEVIGATOSPORITES SPP.
LATROBOSPORITES OHAIENSIS
LYGISTEPOLLENITES BALMEI
LYGISTEPOLLENITES FLORINII
NOTHOFAGIDITES ENDURUS
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.

FIGURE 4. BIOSTRATIGRAPHY OF TURRUM-3, TURRUM RESERVOIR

PODOSPORITES MICROSACCATUS
PROTEACIDITES ANGULALTUS
PROTEACIDITES ANNULARIS
PROTEACIDITES SPP.
RUGULATISPORITES MALLATUS
STEREISPORITES (TRIPUNCTISPORIS) SP.
TRICOLPITES GILLII

2280-85 METERS (DITCH SAMPLE)

AGE : L. EARLY PALEOCENE?
RD1?

ENVIRONMENT : MARINE

PRESERVATION : FAIR-POOR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN

DINOFLAGELLATES
APECTODINIUM SPP.
APECTODINIUM SP. CF. A. SPP.
CERODINIUM SP. CF. C. SPECIOSUM
CLEISTOSPHAERIDIUM SPP.
CORDOSPHAERIDIUM SPP.
CYCLOPSIELLA SPP.
DEFLANDREA DARTMOORIA
DEFLANDREA FOVEOLATA
DEFLANDREA SPP.
EISENACKIA CRASSITABULATA
FIBRADINIUM SPP.
GLAPHYROCYSTA RETIINTEXTA
GLAPHYROCYSTA SPP.
HAFNIASPHAERA SP. CF. H. SP.
OLIGOSPHAERIDIUM COMPLEX
PALAEOCYSTODINIUM AUSTRALINUM
PALAEOCYSTODINIUM GOLZOWENSE
PARALECANIELLA INDENTATA
SENEGALINIUM DILWYNENSIS
SPINIDINIUM SP. CF. S. DENSISPINATUM
SPINIDINIUM MACMURDOENSE
SPINIDINIUM SPP.
SPINIFERITES SPP.
THALASSIPHORA SP. CF. T. PATULA

FIGURE 4. BIOSTRATIGRAPHY OF TURRUM-3, TURRUM RESERVOIR

UNDIFFERENTIATED FORMS
VOZZHENNIKOVIA SP. CF. V. ANGULATA
VOZZHENNIKOVIA APERTURA
VOZZHENNIKOVIA ECHINOIDEA
VOZZHENNIKOVIA SP. CF. V. SPP.

SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
BACULATISPORITES SPP.
CICATRICOSISPORITES SPP.
CYATHIDITES SPP.
DILWYNITES GRANULATUS
DILWYNITES TUBERCULATUS
GAMBIERINA EDWARSII
GAMBIERINA RUDATA
GLEICHENIIDITES SPP.
LAEVIGATOSPORITES SPP.
LATROBOSPORITES CRASSUS
LYGISTEPOLLENITES BALMEI
LYGISTEPOLLENITES FLORINII
NOTHOFAGIDITES BRACHYSPINULOSUS
NOTHOFAGIDITES EMARCUDUS/HETERUS
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PROTEACIDITES ANGULALTUS
PROTEACIDITES SPP.
STEREISPORITES ANTIQUASPORITES
TRICOLPITES GILLII
TRICOLPITES SPP.

2305-10 METERS (DITCH SAMPLE)

AGE : L. EARLY PALEOCENE
RD1

ENVIRONMENT : MARINE

PRESERVATION : FAIR-POOR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
WOODY-COALY KEROGEN

DINOFLAGELLATES
ACHOMOSPHAERA CRASSIPELLIS
ALISOCYSTA SP. CF. A. RETICULATA
APECTODINIUM SPP.

FIGURE 4. BIOSTRATIGRAPHY OF TURRUM-3, TURRUM RESERVOIR

APECTODINIUM SP. CF. A. SPP.
CERODINIUM SP. CF. C. SPECIOSUM
DEFLANDREA SPP.
EISENACKIA CRASSITABULATA
GLAPHYROCYSTA RETIINTEXTA
GLAPHYROCYSTA SPP.
PALAEOCYSTODINIUM AUSTRALINUM
PALAEOCYSTODINIUM GOLZOWENSE
SENEGALINIUM DILWYNENSIS
SPINIDINIUM SP. CF. S. DENSISPINATUM
SPINIDINIUM SP. CF. S. MACMURDOENSE
SPINIDINIUM SPP.
SPINIFERITES SPP.
UNDIFFERENTIATED FORMS
VOZZHENNIKOVIA ANGULATA
VOZZHENNIKOVIA APERTURA
VOZZHENNIKOVIA SPP.

SPORES AND POLLEN

AUSTALOPOLLIS OBSCURUS
BACULATISPORITES SPP.
CYATHIDITES SPP.
DILWYNITES GRANULATUS
GAMBIERINA RUDATA
HALORAGACIDITES HARRISII
LAEVIGATOSPORITES SPP.
LYGISTEPOLLENITES BALMEI
NOTHOFAGIDITES ENDURUS
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PROTEACIDITES SPP.
STEREISPORITES (TRIPUNCTISPORIS) SP.
STEREISPORITES ANTIQUASPORITES
TRICOLPITES GILLII

2325-30 METERS (DITCH SAMPLE)

AGE : L. EARLY PALEOCENE
RD1

ENVIRONMENT : MARINE

PRESERVATION : POOR-FAIR

SPECIES: OTHER

BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
WOODY-COALY KEROGEN

FIGURE 4. BIOSTRATIGRAPHY OF TURRUM-3, TURRUM RESERVOIR

DINOFLAGELLATES
- APECTODINIUM SP. CF. A. SPP.
- CERODINIUM SP. CF. C. SPECIOSUM
- CYCLOPSIELLA SPP.
- DEFLANDREA SPP.
- EISENACKIA CRASSITABULATA
- GLAPHYROCYSTA RETIINTEXTA
- PALAEOCYSTODINIUM AUSTRALINUM
- PALAEOCYSTODINIUM GOLZOWENSE
- SENEGALINIUM DILWYNENSIS
- SPINIDINIUM SP. CF. S. DENSISPINATUM
- VOZZHENNIKOVIA ANGULATA
- VOZZHENNIKOVIA APERTURA
- VOZZHENNIKOVIA SPP.

SPORES AND POLLEN
- AUSTALOPOLLIS OBSCURUS
- CYATHIDITES SPP.
- DILWYNITES GRANULATUS
- DILWYNITES TUBERCULATUS
- GLEICHENIIDITES SPP.
- LAEVIGATOSPORITES SPP.
- LYGISTEPOLLENITES BALMEI
- LYGISTEPOLLENITES FLORINII
- NOTHOFAGIDITES ENDURUS
- PHYLLOCLADIDITES MAWSONII
- PODOCARPIDITES SPP.
- PODOSPORITES ANTARCTICUS
- PODOSPORITES MICROSACCATUS
- PROTEACIDITES ANGULALTUS
- PROTEACIDITES SP.
- PROTEACIDITES SPP.
- STEREISPORITES ANTIQUASPORITES
- TRICOLPITES GILLII

2365-70 METERS (DITCH SAMPLE)

AGE : L. EARLY PALEOCENE
RD1?

ENVIRONMENT : MARGINAL-NONMARINE

PRESERVATION : POOR-FAIR

SPECIES: OTHER
- BIODEGRADED TERRESTRIAL
- DINOFLAGELLATES-ACRITARCHS
- HERBACEOUS KEROGEN (CUTICLE)
- HERBACEOUS KEROGEN (SPORE-POLLEN)
- WOODY-COALY KEROGEN

DINOFLAGELLATES

FIGURE 4. BIOSTRATIGRAPHY OF TURRUM-3, TURRUM RESERVOIR

APECTODINIUM SPP.
GLAPHYROCYSTA SPP.
PALAEOCYSTODINIUM SP. CF. P. GOLZOWENSE
SENEGALINIUM DILWYNENSIS

SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
CYATHIDITES SPP.
CYCADOPITES SPP.
DILWYNITES GRANULATUS
GAMBIERINA RUDATA
LAEVIGATOSPORITES SPP.
LYGISTEPOLLENITES BALMEI
LYGISTEPOLLENITES FLORINII
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PODOSPORITES MICROSACCATUS
PROTEACIDITES SP.
PROTEACIDITES SPP.
STEREISPORITES ANTIQUASPORITES
TRICOLPITES GILLII
TRICOLPITES SPP.

2370-75 METERS (DITCH SAMPLE)

AGE : EARLY PALEOCENE
RD2

ENVIRONMENT : NONMARINE

FAUNA & FLORA : GRAY SHALE, AMORPH-RICH "COAL"

PRESERVATION : POOR-FAIR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
WOODY-COALY KEROGEN

SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
GAMBIERINA SP. CF. G. EDWARSII
LAEVIGATOSPORITES SPP.
NOTHOFAGIDITES ENDURUS
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PODOSPORITES MICROSACCATUS
PROTEACIDITES SP.

FIGURE 4. BIOSTRATIGRAPHY OF TURRUM-3, TURRUM RESERVOIR

PROTEACIDITES SPP.
TRICOLPITES SPP.
TRICOLPORITES SPP.

2415-20 METERS (DITCH SAMPLE)

AGE : EARLY PALEOCENE
RE1

ENVIRONMENT : MARINE

PRESERVATION : POOR-FAIR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN

DINOFLAGELLATES
ALISOCYSTA RETICULATA
APECTODINIUM SP. CF. A. SPP.
CERODINIUM SP. CF. C. SPECIOSUM
CERODINIUM SPP.
DEFLANDREA SPP.
GLAPHYROCYSTA RETIINTEXTA
HAFNIASPHAERA SP.
SENEGALINIUM DILWYNENSIS
SPINIDINIUM SPP.
SPINIFERITES SPP.
TURBIOSPHAERA FILOSA
VOZZHENNIKOVIA ANGULATA
VOZZHENNIKOVIA APERTURA
VOZZHENNIKOVIA SP. CF. V. ECHINOIDEA
VOZZHENNIKOVIA SPP.

SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
CYATHIDITES SPP.
GLEICHENIIDITES SPP.
HERKOSPORITES ELLIOTII
LAEVIGATOSPORITES SPP.
LYGISTEPOLLENITES BALMEI
LYGISTEPOLLENITES FLORINII
NOTHOFAGIDITES ENDURUS
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PODOSPORITES MICROSACCATUS

FIGURE 4. BIOSTRATIGRAPHY OF TURRUM-3, TURRUM RESERVOIR

PROTEACIDITES ANGULALTUS
PROTEACIDITES SPP.
STEREISPORITES (TRIPUNCTISPORIS) SP.
STEREISPORITES ANTIQUASPORITES
TRICOLPITES GILLII

2440-45 METERS (DITCH SAMPLE)

AGE : EARLY PALEOCENE
RE1

ENVIRONMENT : MARGINAL MARINE?

PRESERVATION : POOR-FAIR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN

DINOFLAGELLATES
ALISOCYSTA SP. CF. A. CIRCUMTABULATA
ALISOCYSTA SP. CF. A. MARGARITA
ALISOCYSTA RETICULATA
APECTODINIUM SP. CF. A. SPP.
CERODINIUM SP. CF. C. SPECIOSUM
DEFLANDREA SPP.
EISENACKIA CRASSITABULATA
PALAEOCYSTODINIUM GOLZOWENSE
SENEGALINIUM DILWYNENSIS
SPINIDINIUM SP. CF. S. DENSISPINATUM
SPINIDINIUM ESSOI
SPINIDINIUM MACMURDOENSE
SPINIDINIUM SPP.
TURBIOSPHAERA FILOSA
VOZZHENNIKOVIA ANGULATA
VOZZHENNIKOVIA SPP.

SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
GLEICHENIIDITES SPP.
LYGISTEPOLLENITES BALMEI
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PODOSPORITES MICROSACCATUS
PROTEACIDITES SPP.
STEREISPORITES ANTIQUASPORITES

FIGURE 4. BIOSTRATIGRAPHY OF TURRUM-3, TURRUM RESERVOIR

2445-50 METERS (DITCH SAMPLE)

AGE : EARLY PALEOCENE
RE1

ENVIRONMENT : MARGINAL MARINE?-NONMARINE

FAUNA & FLORA : COAL, CAVED? MARINE FORMS

PRESERVATION : POOR-FAIR

SPECIES: OTHER
- AMORPHOUS KEROGEN
- BIODEGRADED TERRESTRIAL
- DINOFLAGELLATES-ACRITARCHS
- HERBACEOUS KEROGEN (CUTICLE)
- HERBACEOUS KEROGEN (SPORE-POLLEN)
- WOODY-COALY KEROGEN

DINOFLAGELLATES
- ALISOCYSTA SP. CF. A. RETICULATA
- APECTODINIUM SP. CF. A. SPP.
- CERODINIUM SP. CF. C. SPECIOSUM
- CYCLOPSIELLA SPP.
- DEFLANDREA SPP.
- GLAPHYROCYSTA RETIINTEXTA
- PALAEOPERIDINIUM SP. CF. P. PYROPHORUM
- SENEGALINIUM DILWYNENSIS
- SPINIDINIUM SP. CF. S. DENSISPINATUM
- SPINIDINIUM ESSOI
- SPINIDINIUM SPP.
- TURBIOSPHAERA FILOSA
- VOZZHENNIKOVIA ANGULATA

SPORES AND POLLEN
- AUSTALOPOLLIS OBSCURUS
- BACULATISPORITES SPP.
- CYATHIDITES SPP.
- GLEICHENIIDITES SPP.
- LAEVIGATOSPORITES SPP.
- PHYLLOCLADIDITES MAWSONII
- PODOCARPIDITES SPP.
- PODOSPORITES ANTARCTICUS
- PODOSPORITES MICROSACCATUS
- PROTEACIDITES SP. CF. P. ANGULALTUS
- PROTEACIDITES SPP.
- STEREISPORITES ANTIQUASPORITES
- TRICOLPITES SPP.
- TRICOLPORITES SPP.

2465-70 METERS (DITCH SAMPLE)

FIGURE 4. BIOSTRATIGRAPHY OF TURRUM-3, TURRUM RESERVOIR

AGE : EARLY PALEOCENE
RE2

ENVIRONMENT : MARGINAL MARINE-MARINE

PRESERVATION : POOR-FAIR

SPECIES: OTHER
- AMORPHOUS KEROGEN
- BIODEGRADED TERRESTRIAL
- DINOFLAGELLATES-ACRITARCHS
- HERBACEOUS KEROGEN (CUTICLE)
- HERBACEOUS KEROGEN (SPORE-POLLEN)
- INDETERMINATE FINES
- WOODY-COALY KEROGEN

DINOFLAGELLATES
- APECTODINIUM HOMOMORPHUM
- APECTODINIUM SP. CF. A. SPP.
- CERODINIUM SP. CF. C. SPECIOSUM
- DEFLANDREA SPP.
- GLAPHYROCYSTA RETIINTEXTA
- HYSTRICHOSPHAERIDIUM SP.
- PALAEOCYSTODINIUM AUSTRALINUM
- PALAEOCYSTODINIUM GOLZOWENSE
- PALAEOPERIDINIUM PYROPHORUM
- PARALECANIELLA INDENTATA
- SENEGALINIUM DILWYNENSIS
- SPINIDINIUM SP. CF. S. DENSISPINATUM
- SPINIDINIUM ESSOI
- SPINIDINIUM SP. CF. S. MACMURDOENSE
- SPINIDINIUM SPP.
- TRITHYRODINIUM EVITTII
- TURBIOSPHAERA GALATEA
- VOZZHENNIKOVIA ANGULATA
- VOZZHENNIKOVIA APERTURA

SPORES AND POLLEN
- AUSTALOPOLLIS OBSCURUS
- BACULATISPORITES SPP.
- CYATHIDITES SPP.
- GLEICHENIIDITES SPP.
- HERKOSPORITES ELLIOTII
- LAEVIGATOSPORITES SPP.
- LYGISTEPOLLENITES BALMEI
- LYGISTEPOLLENITES FLORINII
- PHYLLOCLADIDITES MAWSONII
- PODOCARPIDITES SPP.
- PODOSPORITES ANTARCTICUS
- PODOSPORITES MICROSACCATUS
- PROTEACIDITES ANGULALTUS
- PROTEACIDITES SPP.
- STEREISPORITES (TRIPUNCTISPORIS) SP.
- STEREISPORITES ANTIQUASPORITES
- TRICOLPITES GILLII

FIGURE 4. BIOSTRATIGRAPHY OF TURRUM-3, TURRUM RESERVOIR

TRICOLPITES SPP.

2475-80 METERS (DITCH SAMPLE)

AGE : E. E. PALEOC.-?LT. MAAST.?
RF?

ENVIRONMENT : NONMARINE

FAUNA & FLORA : COAL, AMORPHOUS RICH

PRESERVATION : POOR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN
DINOFLAGELLATES
APECTODINIUM SP. CF. A. SPP.
PALAEOCYSTODINIUM GOLZOWENSE
SENEGALINIUM DILWYNENSIS
SPINIDINIUM SPP.
SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
CYATHIDITES SPP.
LYGISTEPOLLENITES BALMEI
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PODOSPORITES MICROSACCATUS
PROTEACIDITES SPP.
STEREISPORITES ANTIQUASPORITES
TRICOLPITES SPP.

2485-90 METERS (DITCH SAMPLE)

AGE : E. E. PALEOC.-?LT. MAAST.
RF

ENVIRONMENT : MARGINAL-NONMARINE

PRESERVATION : POOR-FAIR

FIGURE 4. BIOSTRATIGRAPHY OF TURRUM-3, TURRUM RESERVOIR

SPECIES: OTHER
- AMORPHOUS KEROGEN
- BIODEGRADED TERRESTRIAL
- DINOFLAGELLATES-ACRITARCHS
- HERBACEOUS KEROGEN (CUTICLE)
- HERBACEOUS KEROGEN (SPORE-POLLEN)
- WOODY-COALY KEROGEN

DINOFLAGELLATES
- APECTODINIUM SP. CF. A. SPP.
- CERODINIUM SP. CF. C. SPECIOSUM
- DEFLANDREA SP. CF. D. SP.
- PALAEOCYSTODINIUM GOLZOWENSE
- SENEGALINIUM DILWYNENSIS
- SPINIDINIUM SP. CF. S. DENSISPINATUM
- TRITHYRODINIUM SP. CF. T. EVITTII
- VOZZHENNIKOVIA ANGULATA
- VOZZHENNIKOVIA SPP.

SPORES AND POLLEN
- AUSTALOPOLLIS OBSCURUS
- CYATHIDITES SPP.
- DILWYNITES GRANULATUS
- GLEICHENIIDITES SPP.
- LAEVIGATOSPORITES SPP.
- LYGISTEPOLLENITES BALMEI
- LYGISTEPOLLENITES FLORINII
- PHYLLOCLADIDITES MAWSONII
- PODOCARPIDITES SPP.
- PODOSPORITES ANTARCTICUS
- PODOSPORITES MICROSACCATUS
- PROTEACIDITES ANGULALTUS
- PROTEACIDITES SPP.
- STEREISPORITES (TRIPUNCTISPORIS) SP.
- STEREISPORITES ANTIQUASPORITES
- TRICOLPITES SP. CF. T. CONFESSUS
- TRICOLPITES GILLII
- TRICOLPITES SPP.

2495-2500 METERS (DITCH SAMPLE)

AGE : E. E. PALEOC.-?LT. MAAST.
RF

ENVIRONMENT : MARGINAL-NONMARINE

PRESERVATION : POOR-FAIR

SPECIES: OTHER
- AMORPHOUS KEROGEN
- BIODEGRADED TERRESTRIAL
- DINOFLAGELLATES-ACRITARCHS

FIGURE 4. BIOSTRATIGRAPHY OF TURRUM-3, TURRUM RESERVOIR

HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
WOODY-COALY KEROGEN

DINOFLAGELLATES
APECTODINIUM SP. CF. A. SPP.
CIRCULODINIUM SP. CF. C. DISTINCTUM
DEFLANDREA SP. CF. D. SP.
HYSTRICHOSPHAERIDIUM SP.
SPINIDINIUM SP. CF. S. DENSISPINATUM
SPINIDINIUM SPP.
UNDIFFERENTIATED FORMS
VOZZHENNIKOVIA ANGULATA

SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
BACULATISPORITES SPP.
CYATHIDITES SPP.
EPHEDRIPITES SPP.
GLEICHENIIDITES SPP.
LAEVIGATOSPORITES SPP.
LYGISTEPOLLENITES BALMEI
LYGISTEPOLLENITES FLORINII
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PODOSPORITES MICROSACCATUS
PROTEACIDITES ANGULALTUS
PROTEACIDITES SPP.
STEREISPORITES (TRIPUNCTISPORIS) SP.
STEREISPORITES ANTIQUASPORITES
TRICOLPITES SP. CF. T. CONFESSUS
TRICOLPITES SPP.
TRICOLPORITES SPP.

2525-30 METERS (DITCH SAMPLE)

AGE : E. E. PALEOC.-?LT. MAAST.
RF

ENVIRONMENT : NONMARINE

PRESERVATION : POOR-FAIR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN

FIGURE 4. BIOSTRATIGRAPHY OF TURRUM-3, TURRUM RESERVOIR

DINOFLAGELLATES
- APECTODINIUM SP. CF. A. SPP.
- CERODINIUM SP. CF. C. SPECIOSUM

SPORES AND POLLEN
- AUSTALOPOLLIS OBSCURUS
- BACULATISPORITES SPP.
- CYATHIDITES SPP.
- LAEVIGATOSPORITES SPP.
- NOTHOFAGIDITES ENDURUS
- PHYLLOCLADIDITES MAWSONII
- PODOCARPIDITES SPP.
- PODOSPORITES ANTARCTICUS
- PODOSPORITES MICROSACCATUS
- PROTEACIDITES SPP.
- TRICOLPITES CONFESSUS
- TRICOLPITES GILLII
- TRICOLPITES SPP.
- TRICOLPORITES SPP.

2540-45 METERS (DITCH SAMPLE)

AGE : E. E. PALEOC.-?LT. MAAST.
RF

ENVIRONMENT : NONMARINE

PRESERVATION : POOR-FAIR

SPECIES: OTHER
- AMORPHOUS KEROGEN
- BIODEGRADED TERRESTRIAL
- DINOFLAGELLATES-ACRITARCHS
- HERBACEOUS KEROGEN (CUTICLE)
- HERBACEOUS KEROGEN (SPORE-POLLEN)
- INDETERMINATE FINES
- WOODY-COALY KEROGEN

DINOFLAGELLATES
- APECTODINIUM SP. CF. A. SPP.
- DEFLANDREA SPP.
- VOZZHENNIKOVIA SPP.

SPORES AND POLLEN
- AUSTALOPOLLIS OBSCURUS
- BACULATISPORITES SPP.
- CYATHIDITES SPP.
- GAMBIERINA RUDATA
- LYGISTEPOLLENITES BALMEI
- NOTHOFAGIDITES ENDURUS
- PHYLLOCLADIDITES MAWSONII
- PODOCARPIDITES SPP.
- PODOSPORITES MICROSACCATUS

FIGURE 4. BIOSTRATIGRAPHY OF TURRUM-3, TURRUM RESERVOIR

PROTEACIDITES ANGULALTUS
PROTEACIDITES SPP.
STEREISPORITES ANTIQUASPORITES
TRICOLPITES CONFESSUS
TRICOLPITES SPP.
TRICOLPORITES SPP.

2550-55 METERS (DITCH SAMPLE)

AGE : E. E. PALEOC.-?LT. MAAST.
RF

ENVIRONMENT : NONMARINE

PRESERVATION : POOR-FAIR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN
DINOFLAGELLATES
DEFLANDREA SPP.
SPINIDINIUM SPP.
SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
BACULATISPORITES SPP.
CHOMOTRILETES SPP.
CYATHIDITES SPP.
GLEICHENIIDITES SPP.
LAEVIGATOSPORITES SPP.
LYGISTEPOLLENITES BALMEI
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PODOSPORITES MICROSACCATUS
PROTEACIDITES ANGULALTUS
PROTEACIDITES SPP.
STEREISPORITES ANTIQUASPORITES
TRICOLPITES CONFESSUS
TRICOLPITES SPP.

2560-65 METERS (DITCH SAMPLE)

FIGURE 4. BIOSTRATIGRAPHY OF TURRUM-3, TURRUM RESERVOIR

AGE : E. E. PALEOC.-?LT. MAAST.?
RF?

ENVIRONMENT : NONMARINE

PRESERVATION : POOR-FAIR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN
SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
BACULATISPORITES SPP.
CYATHIDITES SPP.
CYCADOPITES SPP.
GLEICHENIIDITES SPP.
LYGISTEPOLLENITES BALMEI
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PODOSPORITES MICROSACCATUS
PROTEACIDITES SPP.
STEREISPORITES ANTIQUASPORITES
TRICOLPORITES SPP.

2575-80 METERS (DITCH SAMPLE)

AGE : E. E. PALEOC.-?LT. MAAST.?
RF?

ENVIRONMENT : NONMARINE

PRESERVATION : POOR-FAIR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN
DINOFLAGELLATES
PARALECANIELLA INDENTATA
SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
BACULATISPORITES SPP.
CYATHIDITES SPP.

FIGURE 4. BIOSTRATIGRAPHY OF TURRUM-3, TURRUM RESERVOIR

GLEICHENIIDITES SPP.
LYGISTEPOLLENITES BALMEI
LYGISTEPOLLENITES FLORINII
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PODOSPORITES MICROSACCATUS
PROTEACIDITES ANGULALTUS
PROTEACIDITES SPP.
STEREISPORITES (TRIPUNCTISPORIS) SP.
STEREISPORITES ANTIQUASPORITES
TRICOLPITES SPP.

2580-85 METERS (DITCH SAMPLE)

AGE : E. E. PALEOC.-?LT. MAAST.?
RF?

ENVIRONMENT : NONMARINE-MARGINAL MARINE

PRESERVATION : POOR-FAIR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN
DINOFLAGELLATES
APECTODINIUM HOMOMORPHUM
APECTODINIUM SP. CF. A. HYPERACANTHUM
PARALECANIELLA INDENTATA
SENEGALINIUM DILWYNENSIS
SPINIDINIUM SP. CF. S. MACMURDOENSE
SPINIDINIUM SPP.
SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
CYATHIDITES SPP.
LYGISTEPOLLENITES BALMEI
LYGISTEPOLLENITES FLORINII
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PODOSPORITES MICROSACCATUS
PROTEACIDITES ANGULALTUS
PROTEACIDITES SPP.
TRICOLPITES CONFESSUS
TRICOLPITES GILLII

FIGURE 4. BIOSTRATIGRAPHY OF TURRUM-3, TURRUM RESERVOIR

TRICOLPITES SPP.

2614.0 METERS (SIDE-WALL CORE)

AGE : PROB. L. MAASTRICHTIAN?
RG?

ENVIRONMENT : MARINE

FAUNA & FLORA : ABUND PYRITE (SM), REWORKED?

PRESERVATION : VERY POOR-POOR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN

DINOFLAGELLATES
ACRITARCH SP. 1
ALISOCYSTA SP. CF. A. CIRCUMTABULATA
ALISOCYSTA SP. CF. A. MARGARITA
APECTODINIUM SP. CF. A. HOMOMORPHUM
CYCLOPSIELLA SP. CF. C. SPP.
DEFLANDREA SPP.
OLIGOSHPAERIDIUM SP. CF. O. SPP.
OLIGOSPHAERIDIUM COMPLEX
OPERCULODINIUM CENTROCARPUM
PALAEOCYSTODINIUM GOLZOWENSE
SENEGALINIUM DILWYNENSIS
SPINIDINIUM SP. CF. S. DENSISPINATUM
SPINIDINIUM SPP.
SPINIFERITES SPP.
SYSTEMATOPHORA SP. CF. S. SP.
UNDIFFERENTIATED FORMS

SPORES AND POLLEN
GAMBIERINA EDWARSII
GAMBIERINA RUDATA
GLEICHENIIDITES SPP.
ILEXPOLLENITES ANGULOCLAVATUS
LAEVIGATOSPORITES SPP.
LATROBOSPORITES CRASSUS
LYGISTEPOLLENITES BALMEI
NOTHOFAGIDITES BRACHYSPINULOSUS
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PROTEACIDITES ANGULALTUS

FIGURE 4. BIOSTRATIGRAPHY OF TURRUM-3, TURRUM RESERVOIR

PROTEACIDITES SPP.
STEREISPORITES ANTIQUASPORITES
TRICOLPITES GILLII

2615-18 METERS (DITCH SAMPLE)

AGE : PROB. L. MAASTRICHTIAN?
RG?

ENVIRONMENT : MARGINAL MARINE

FAUNA & FLORA : FREQ CAVINGS, INCL A.HOMO.

PRESERVATION : POOR-FAIR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
WOODY-COALY KEROGEN
DINOFLAGELLATES
APECTODINIUM HOMOMORPHUM
APECTODINIUM QUINQUELATUM
APECTODINIUM SPP.
AREOSPHAERIDIUM SP.
DEFLANDREA SPP.
GLAPHYROCYSTA SP.
OPERCULODINIUM SP. CF. O. CENTROCARPUM
PALAEOPERIDINIUM PYROPHORUM
SENEGALINIUM DILWYNENSIS
SPINIDINIUM SP. CF. S. DENSISPINATUM
SPINIDINIUM SP. CF. S. ESSOI
SPINIDINIUM MACMURDOENSE
SPINIDINIUM SPP.
SPINIFERITES SPP.
UNDIFFERENTIATED FORMS
VOZZHENNIKOVIA ANGULATA
SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
GLEICHENIIDITES SPP.
HERKOSPORITES ELLIOTII
LAEVIGATOSPORITES SPP.
LILIACIDITES SPP.
LYGISTEPOLLENITES BALMEI
LYGISTEPOLLENITES FLORINII
NOTHOFAGIDITES ENDURUS
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.

FIGURE 4. BIOSTRATIGRAPHY OF TURRUM-3, TURRUM RESERVOIR

PODOSPORITES ANTARCTICUS
PODOSPORITES MICROSACCATUS
PROTEACIDITES ANGULALTUS
PROTEACIDITES SPP.
STEREISPORITES (TRIPUNCTISPORIS) SP.
STEREISPORITES ANTIQUASPORITES
TRICOLPITES SP. CF. T. CONFESSUS
TRICOLPITES GILLII
TRICOLPITES SPP.
TRICOLPORITES SPP.

2645-50 METERS (DITCH SAMPLE)

AGE : PROB. L. MAASTRICHTIAN
RG

ENVIRONMENT : MARGINAL MARINE

PRESERVATION : POOR-V POOR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN
DINOFLAGELLATES
DEFLANDREA SPP.
HOMOTRYBLIUM SP. AFF. H. OCEANICUM
HYSTRICHOSPHAERIDIUM SP.
ISABELIDINIUM BAKERI
ISABELIDINIUM SP. CF. I. SPP.
PALAEOCYSTODINIUM GOLZOWENSE
SENEGALINIUM DILWYNENSIS
SPINIDINIUM SPP.
UNDIFFERENTIATED FORMS
SPORES AND POLLEN
BACULATISPORITES SPP.
CYATHIDITES SPP.
GLEICHENIIDITES SPP.
LATROBOSPORITES OHAIENSIS
LILIACIDITES SPP.
LYGISTEPOLLENITES BALMEI
LYGISTEPOLLENITES FLORINII
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PROTEACIDITES SP. AFF. P. AMOLOSEXINUS
PROTEACIDITES ANGULALTUS

FIGURE 4. BIOSTRATIGRAPHY OF TURRUM-3, TURRUM RESERVOIR

PROTEACIDITES SPP.
STEREISPORITES (TRIPUNCTISPORIS) SP.
STEREISPORITES ANTIQUASPORITES

2647.0 METERS (SIDE-WALL CORE)

AGE : PROB. L. MAASTRICHTIAN
RG

ENVIRONMENT : MARINE

FAUNA & FLORA : ABUND PYRITE (SM)

PRESERVATION : VERY POOR-POOR

SPECIES: OTHER
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN
DINOFLAGELLATES
ALISOCYSTA CIRCUMTABULATA
DEFLANDREA SPP.
FIBROCYSTA SPP.
HYSTRICHOSPHAERIDIUM SP.
OLIGOSHPAERIDIUM SPP.
OLIGOSPHAERIDIUM COMPLEX
PALAEOCYSTODINIUM SPP.
PARALECANIELLA SP. CF. P. INDENTATA
SPINIFERITES SPP.
TRITHYRODINIUM EVITTII
UNDIFFERENTIATED FORMS
SPORES AND POLLEN
CYATHIDITES SPP.
DILWYNITES GRANULATUS
DILWYNITES SP. CF. D. TUBERCULATUS
GAMBIERINA EDWARSII
GAMBIERINA RUDATA
GLEICHENIIDITES SPP.
HALORAGACIDITES HARRISII
HERKOSPORITES ELLIOTII
LAEVIGATOSPORITES SPP.
LATROBOSPORITES CRASSUS
LYGISTEPOLLENITES BALMEI
LYGISTEPOLLENITES FLORINII
MALVACILPOLLIS SP. CF. M. DIVERSUS
NOTHOFAGIDITES BRACHYSPINULOSUS
PHYLLOCLADIDITES MAWSONII

FIGURE 4. BIOSTRATIGRAPHY OF TURRUM-3, TURRUM RESERVOIR

PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PODOSPORITES MICROSACCATUS
PROTEACIDITES ANGULALTUS
PROTEACIDITES SPP.
STEREISPORITES (TRIPUNCTISPORIS) SP.
STEREISPORITES ANTIQUASPORITES
TETRACOLPORITES VERRUCOSUS
TRICOLPITES GILLII
TRICOLPITES SPP.
TRICOLPITES WAIPARAENSIS
TRICOLPORITES SPP.

2700-5 METERS (DITCH SAMPLE)

AGE : LATE MAASTRICHTIAN
MA

ENVIRONMENT : MARGINAL MARINE

PRESERVATION : FAIR-POOR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN
DINOFLAGELLATES
PALAEOCYSTODINIUM SPP.
SPINIFERITES SPP.
SPORES AND POLLEN
BACULATISPORITES SPP.
CICATRICOSISPORITES SPP.
CYATHIDITES SPP.
GAMBIERINA EDWARSII
GAMBIERINA RUDATA
GLEICHENIIDITES SPP.
LAEVIGATOSPORITES SPP.
NOTHOFAGIDITES ENDURUS
PERIPOROPOLLENITES POLYPORATUS
PEROTRILELTES SP.
PODOCARPIDITES SPP.
PODOSPORITES MICROSACCATUS
PROTEACIDITES SP. CF. P. ADENANTHOIDES
PROTEACIDITES SPP.
TETRACOLPORITES VERRUCOSUS
TRICOLPITES CONFESSUS
TRICOLPITES LONGUS

FIGURE 4. BIOSTRATIGRAPHY OF TURRUM-3, TURRUM RESERVOIR

TRICOLPORITES LILLIEI
TRIPOROPOLLENITES SECTILIS

2710-15 METERS (DITCH SAMPLE)

AGE : LATE MAASTRICHTIAN?
MA?

ENVIRONMENT : PROB NONMARINE

FAUNA & FLORA : SOME PYRITE

PRESERVATION : POOR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN
DINOFLAGELLATES
TRITHYRODINIUM SP. CF. T. EVITTII
SPORES AND POLLEN
BACULATISPORITES SPP.
CYATHIDITES SPP.
GAMBIERINA EDWARSII
GAMBIERINA RUDATA
GLEICHENIIDITES SPP.
LAEVIGATOSPORITES SPP.
PODOCARPIDITES SPP.
PROTEACIDITES SPP.
TRICOLPITES CONFESSUS

2755-60 METERS (DITCH SAMPLE)

AGE : LATE MAASTRICHTIAN?
MA?

ENVIRONMENT : MARGINAL MARINE

PRESERVATION : POOR

SPECIES: OTHER
BIODEGRADED TERRESTRIAL
HERBACEOUS KEROGEN (SPORE-POLLEN)

FIGURE 4. BIOSTRATIGRAPHY OF TURRUM-3, TURRUM RESERVOIR

INDETERMINATE FINES
WOODY-COALY KEROGEN
DINOFLAGELLATES
SENEGALINIUM SP. CF. S. DILWYNENSIS
UNDIFFERENTIATED FORMS
SPORES AND POLLEN
GAMBIERINA EDWARSII
GAMBIERINA RUDATA
GLEICHENIIDITES SPP.
LYGISTEPOLLENITES SP. CF. L. BALMEI
LYGISTEPOLLENITES FLORINII
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PROTEACIDITES SPP.
STEREISPORITES (TRIPUNCTISPORIS) SP.
STEREISPORITES ANTIQUASPORITES
TRICOLPITES GILLII

2805-10 METERS (DITCH SAMPLE)

AGE : LATE MAASTRICHTIAN?
MA?

ENVIRONMENT : NONMARINE

PRESERVATION : POOR-FAIR

SPECIES: OTHER
BIODEGRADED TERRESTRIAL
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN
SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
BACULATISPORITES SPP.
CYATHIDITES SPP.
DILWYNITES GRANULATUS
DILWYNITES TUBERCULATUS
ERICIPITES SPP.
GAMBIERINA EDWARSII
GAMBIERINA RUDATA
GLEICHENIIDITES SPP.
HALORAGACIDITES HARRISII
HERKOSPORITES ELLIOTII
LAEVIGATOSPORITES SPP.
LYGISTEPOLLENITES BALMEI
NOTHOFAGIDITES ENDURUS
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS

FIGURE 4. BIOSTRATIGRAPHY OF TURRUM-3, TURRUM RESERVOIR

PODOSPORITES MICROSACCATUS
PROTEACIDITES ADENANTHOIDES
PROTEACIDITES SPP.
STEREISPORITES (TRIPUNCTISPORIS) SP.
STEREISPORITES ANTIQUASPORITES
TRICOLPITES CONFESSUS
TRICOLPITES GILLII
TRICOLPORITES SPP.

APPENDIX D

Age Summary and Data

FIGURE 5. BIOSTRATIGRAPHY OF TURRUM-2, TURRUM RESERVOIR

A G E S U M M A R Y

(DEPTH IN METERS)

NO SAMPLES ABOVE A DEPTH OF 1986.0 METERS

1986.0	EARLY EOCENE SZ
2115.2	LATE PALEOCENE RA?
2149.3	LATE PALEOCENE RB?
2197.8	E. LATE PALEOCENE RC
2292.0	L. EARLY PALEOCENE RD1
2332.5	INDETERMINATE
2335-40	EARLY PALEOCENE RD2
2365.7	INDETERMINATE
2365-70	EARLY PALEOCENE RD2
2385-90	INDETERMINATE
2465-70	EARLY PALEOCENE RE
2480-85	E. E. PALEOC.-?LT. MAAST. RF
2554.7	INDETERMINATE
2555-60	E. E. PALEOC.-?LT. MAAST. RF
2588.2	PROB. L. MAASTRICHTIAN RG
2647.1	INDETERMINATE
2665.3	LATE MAASTRICHTIAN MA

FIGURE 5. BIOSTRATIGRAPHY OF TURRUM-2, TURRUM RESERVOIR

A G E S U M M A R Y - C O N T I N U E D

(DEPTH IN METERS)

2665.3 BOTTOM WELL SAMPLE EXAMINED

FIGURE 5. BIOSTRATIGRAPHY OF TURRUM-2, TURRUM RESERVOIR

E N V I R O N M E N T S U M M A R Y

(DEPTH IN METERS)

NO SAMPLES ABOVE A DEPTH OF 1986.0 METERS

1986.0	MARGINAL MARINE-MARINE
2025.0	NONMARINE
2073.4	MARGINAL MARINE-MARINE
2197.8	MARINE-MARGINAL MARINE
2228.0	MARINE
2292.0	MARGINAL MARINE
2332.5	NONMARINE
2335-40	NONMARINE-MARGINAL MARINE
2345-50	NONMARINE
2465-70	MARGINAL MARINE-MARINE
2480-85	MARGINAL MARINE
2498.3	NONMARINE
2588.2	MARGINAL-NONMARINE
2665.3	BOTTOM WELL SAMPLE EXAMINED

FIGURE 5. BIOSTRATIGRAPHY OF TURRUM-2, TURRUM RESERVOIR

1986.0 METERS (SIDE-WALL CORE)

AGE : EARLY EOCENE
SZ

ENVIRONMENT : MARGINAL MARINE-MARINE

PRESERVATION : FAIR

SPECIES: OTHER
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (SPORE-POLLEN)
DINOFLAGELLATES
APECTODINIUM SP. CF. A. SPP.
DEFLANDREA SPP.
SPORES AND POLLEN
BACULATISPORITES SPP.
LYGISTEPOLLENITES BALMEI
LYGISTEPOLLENITES FLORINII
NOTHOFAGIDITES GONIATUS
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PROTEACIDITES MINUTUS
PROTEACIDITES SP.
PROTEACIDITES SPP.
STEREISPORITES SP. CF. S. (TRIPUNCTISPORIS) SP.
STEREISPORITES ANTIQUASPORITES

2025.0 METERS (SIDE-WALL CORE)

AGE : EARLY EOCENE
SZ

ENVIRONMENT : NONMARINE

PRESERVATION : POOR

SPECIES: SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
BACULATISPORITES SPP.
CYATHAEIDITES GIGANTIS
DILWYNITES GRANULATUS
GAMBIERINA RUDATA
GLEICHENIIDITES SPP.
HERKOSPORITES ELLIOTII
LAEVIGATOSPORITES SPP.
LATROBOSPORITES OHAIENSIS
LYCOPODIUMSPORITES SPP.
LYGISTEPOLLENITES BALMEI
LYGISTEPOLLENITES FLORINII

FIGURE 5. BIOSTRATIGRAPHY OF TURRUM-2, TURRUM RESERVOIR

NOTHOFAGIDITES BRACHYSPINULOSUS
NOTHOFAGIDITES ENDURUS
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PROTEACIDITES SP. CF. P. ANGULALTUS
PROTEACIDITES SPP.
STEREISPORITES (TRIPUNCTISPORIS) SP.
STEREISPORITES ANTIQUASPORITES

2073.4 METERS (SIDE-WALL CORE)

AGE : EARLY EOCENE
SZ

ENVIRONMENT : MARGINAL MARINE-MARINE

PRESERVATION : POOR

SPECIES: DINOFLAGELLATES
APECTODINIUM SP. CF. A. SPP.
CERODINIUM SP. CF. C. SPECIOSUM
HYSTRICHOKOLPOMA SP. CF. H. SP.
SENEGALINIUM SP. CF. S. DILWYNENSIS
UNDIFFERENTIATED FORMS
SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
BACULATISPORITES SPP.
CYATHIDITES SPP.
EPHEDRIPITES SPP.
GLEICHENIIDITES SPP.
HERKOSPORITES ELLIOTII
LAEVIGATOSPORITES SPP.
LATROBOSPORITES OHAIENSIS
LYGISTEPOLLENITES BALMEI
LYGISTEPOLLENITES FLORINII
NOTHOFAGIDITES ENDURUS
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PROTEACIDITES ANNULARIS
PROTEACIDITES SPP.
STEREISPORITES ANTIQUASPORITES

2115.2 METERS (SIDE-WALL CORE)

AGE : LATE PALEOCENE

FIGURE 5. BIOSTRATIGRAPHY OF TURRUM-2, TURRUM RESERVOIR

RA?

ENVIRONMENT : MARGINAL MARINE-MARINE

PRESERVATION : POOR

SPECIES: DINOFLAGELLATES
CYCLOPSIELLA SPP.
MICRHYSTRIDIUM SPP.
PALAEOCYSTODINIUM SP. CF. P. GOLZOWENSE
SENEGALINIUM DILWYNENSIS
SPINIFERITES SP. CF. S. SPP.
UNDIFFERENTIATED FORMS
SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
BACULATISPORITES SPP.
CUPANIEIDITES SP. CF. C. ORTHOTEICHUS
CYATHAEIDITES GIGANTIS
CYATHIDITES SPP.
DILWYNITES GRANULATUS
DILWYNITES TUBERCULATUS
GLEICHENIIDITES SPP.
LAEVIGATOSPORITES SPP.
LYCOPODIUMSPORITES SPP.
LYGISTEPOLLENITES BALMEI
LYGISTEPOLLENITES FLORINII
NOTHOFAGIDITES EMARCUDUS/HETERUS
NOTHOFAGIDITES ENDURUS
NOTHOFAGIDITES SP. CF. N. GONIATUS
PERIPOROPOLLENITES POLYPORATUS
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PROTEACIDITES SP. CF. P. ANGULALTUS
PROTEACIDITES SP.
PROTEACIDITES SPP.
STEREISPORITES ANTIQUASPORITES
TRICOLPITES SPP.

2149.3 METERS (SIDE-WALL CORE)

AGE : LATE PALEOCENE
RB?

ENVIRONMENT : MARGINAL MARINE-MARINE

PRESERVATION : POOR

SPECIES: DINOFLAGELLATES
APECTODINIUM SPP.

FIGURE 5. BIOSTRATIGRAPHY OF TURRUM-2, TURRUM RESERVOIR

APECTODINIUM SP. CF. A. SPP.
GLAPHYROCYSTA SPP.
ROTTNESTIA SP. CF. R. BORUSSICA
SENEGALINIUM DILWYNENSIS
UNDIFFERENTIATED FORMS

SPORES AND POLLEN

AUSTALOPOLLIS OBSCURUS
CLAVIFERA TRIPLEX
CYATHAEIDITES GIGANTIS
CYATHIDITES SPP.
DILWYNITES GRANULATUS
DILWYNITES TUBERCULATUS
GAMBIERINA EDWARSII
GLEICHENIIDITES SPP.
LAEVIGATOSPORITES SPP.
LATROBOSPORITES CRASSUS
LATROBOSPORITES OHAIENSIS
LYGISTEPOLLENITES BALMEI
LYGISTEPOLLENITES FLORINII
NOTHOFAGIDITES BRACHYSPINULOSUS
NOTHOFAGIDITES EMARCUDUS/HETERUS
NOTHOFAGIDITES ENDURUS
PERIPOROPOLLENITES POLYPORATUS
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PODOSPORITES MICROSACCATUS
PROTEACIDITES ANGULALTUS
PROTEACIDITES MINUTUS
PROTEACIDITES SP.
PROTEACIDITES SPP.
STEREISPORITES (TRIPUNCTISPORIS) SP.
STEREISPORITES ANTIQUASPORITES
TRICOLPITES SPP.
VERRUCATOSPORITES SP. 3

2197.8 METERS (SIDE-WALL CORE)

AGE : E. LATE PALEOCENE
RC

ENVIRONMENT : MARINE-MARGINAL MARINE

PRESERVATION : POOR

SPECIES: OTHER

BOTRYOCCUS SPP.

DINOFLAGELLATES

ALISOCYSTA CIRCUMTABULATA
APECTODINIUM SP. CF. A. HYPERACANTHUM

FIGURE 5. BIOSTRATIGRAPHY OF TURRUM-2, TURRUM RESERVOIR

APECTODINIUM SPP.
APECTODINIUM SP. CF. A. SPP.
CERODINIUM SP. CF. C. SPECIOSUM
DEFLANDREA SP. CF. D. FLOUNDERENSIS
DEFLANDREA MEDCALFII
DEFLANDREA SPP.
GINGINODINIUM SP. CF. G. TABULATUM
GLAPHYROCYSTA RETIINTEXTA
GLAPHYROCYSTA SPP.
PALAEOCYSTODINIUM GOLZOWENSE
PALAEOCYSTODINIUM SP.
SENEGALINIUM DILWYNENSIS
UNDIFFERENTIATED FORMS

SPORES AND POLLEN
CICATRICOSISPORITES SPP.
CYATHAEIDITES GIGANTIS
CYATHIDITES SPP.
GAMBIERINA EDWARSII
GLEICHENIIDITES SPP.
LAEVIGATOSPORITES SPP.
LATROBOSPORITES CRASSUS
LATROBOSPORITES OHAIENSIS
LYGISTEPOLLENITES BALMEI
LYGISTEPOLLENITES FLORINII
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PODOSPORITES MICROSACCATUS
PROTEACIDITES ANGULALTUS
PROTEACIDITES SPP.
TRICOLPITES GILLII

2228.0 METERS (SIDE-WALL CORE)

AGE : E. LATE PALEOCENE
RC

ENVIRONMENT : MARINE

PRESERVATION : FAIR-POOR

SPECIES: DINOFLAGELLATES
APECTODINIUM SP. CF. A. SPP.
CERODINIUM SP. CF. C. SPECIOSUM
CORDOSPHAERIDIUM FIBROSPINOSUM
DEFLANDREA SP. CF. D. FLOUNDERENSIS
DEFLANDREA SP. CF. D. MEDCALFII
DEFLANDREA SPP.
GLAPHYROCYSTA RETIINTEXTA
GLAPHYROCYSTA SPP.

FIGURE 5. BIOSTRATIGRAPHY OF TURRUM-2, TURRUM RESERVOIR

ISABELIDINIUM SP. CF. I. BAKERI
ISABELIDINIUM PELLUCIDUM
ISABELIDINIUM SP.
ISABELIDINIUM SPP.
MICRHYSTRIDIUM SPP.
PALAEOCYSTODINIUM AUSTRALINUM
PALAEOCYSTODINIUM GOLZOWENSE
PALAEOCYSTODINIUM SP.
SENEGALINIUM DILWYNENSIS
SPINIDINIUM SP. CF. S. MACMURDOENSE
SPINIFERITES SPP.
TURBIOSPHAERA SP. CF. T. FILOSA
VERYHACHIUM SPP.

SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
BACULATISPORITES SPP.
CYATHAEIDITES GIGANTIS
CYATHIDITES SPP.
DILWYNITES GRANULATUS
GLEICHENIIDITES SPP.
HERKOSPORITES ELLIOTII
LAEVIGATOSPORITES SPP.
LATROBOSPORITES CRASSUS
LYGISTEPOLLENITES BALMEI
LYGISTEPOLLENITES FLORINII
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PROTEACIDITES ANGULALTUS
PROTEACIDITES MINUTUS
PROTEACIDITES SPP.
STEREISPORITES ANTIQUASPORITES
TRICOLPITES PHILLIPSII

2260.8 METERS (SIDE-WALL CORE)

AGE : E. LATE PALEOCENE
RC

ENVIRONMENT : MARINE

PRESERVATION : POOR

SPECIES: DINOFLAGELLATES
ACHOMOSPHAERA SP.
CORDOSPHAERIDIUM FIBROSPINOSUM
DEFLANDREA SPP.
GLAPHYROCYSTA RETIINTEXTA
ISABELIDINIUM SP. CF. I. BAKERI
PALAEOCYSTODINIUM GOLZOWENSE

FIGURE 5. BIOSTRATIGRAPHY OF TURRUM-2, TURRUM RESERVOIR

PALAEOPERIDINIUM SP. CF. P. PYROPHORUM
PARALECANIELLA INDENTATA
SENEGALINIUM DILWYNENSIS
SPINIDINIUM SP. CF. S. MACMURDOENSE
SPINIFERITES SPP.
UNDIFFERENTIATED FORMS

SPORES AND POLLEN

CICATRICOSISPORITES SPP.
CYATHAEIDITES GIGANTIS
CYATHIDITES SPP.
GLEICHENIIDITES SPP.
LAEVIGATOSPORITES SPP.
LATROBOSPORITES OHAIENSIS
LYGISTEPOLLENITES BALMEI
LYGISTEPOLLENITES FLORINII
NOTHOFAGIDITES BRACHYSPINULOSUS
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PROTEACIDITES ANGULALTUS
PROTEACIDITES SPP.

2292.0 METERS (SIDE-WALL CORE)

AGE : L. EARLY PALEOCENE
RD1

ENVIRONMENT : MARGINAL MARINE

PRESERVATION : POOR

SPECIES: OTHER

AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN

DINOFLAGELLATES

CERODINIUM SP. CF. C. SPECIOSUM
CERODINIUM SPP.
DEFLANDREA SP. CF. D. FLOUNDERENSIS
DEFLANDREA SP. CF. D. MEDCALFII
DEFLANDREA SPP.
EISENACKIA CRASSITABULATA
GLAPHYROCYSTA RETIINTEXTA
ISABELIDINIUM BAKERI
SENEGALINIUM DILWYNENSIS
SPINIDINIUM SPP.

FIGURE 5. BIOSTRATIGRAPHY OF TURRUM-2, TURRUM RESERVOIR

VOZZHENNIKOVIA ANGULATA
VOZZHENNIKOVIA APERTURA
SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
GAMBIERINA EDWARSII
GLEICHENIIDITES SPP.
LYGISTEPOLLENITES BALMEI
LYGISTEPOLLENITES FLORINII
NOTHOFAGIDITES BRACHYSPINULOSUS
NOTHOFAGIDITES ENDURUS
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PROTEACIDITES ANGULALTUS
PROTEACIDITES SPP.
STEREISPORITES ANTIQUASPORITES

2332.5 METERS (SIDE-WALL CORE)

AGE : INDETERMINATE

ENVIRONMENT : NONMARINE

PRESERVATION : POOR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN
SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
CYATHIDITES SPP.
DILWYNITES GRANULATUS
GAMBIERINA EDWARSII
GLEICHENIIDITES SPP.
LYGISTEPOLLENITES BALMEI
LYGISTEPOLLENITES FLORINII
NOTHOFAGIDITES BRACHYSPINULOSUS
NOTHOFAGIDITES ENDURUS
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PODOSPORITES MICROSACCATUS
PROTEACIDITES ANGULALTUS
PROTEACIDITES SPP.
STEREISPORITES (TRIPUNCTISPORIS) SP.
TRIORITES SP.

FIGURE 5. BIOSTRATIGRAPHY OF TURRUM-2, TURRUM RESERVOIR

2335-40 METERS (DITCH SAMPLE)

AGE : EARLY PALEOCENE
RD2

ENVIRONMENT : NONMARINE-MARGINAL MARINE

FAUNA & FLORA : FREQ CAVINGS, APECTO.,SPINOZONO.

PRESERVATION : POOR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN
DINOFLAGELLATES
APECTODINIUM SP. CF. A. SPP.
SENEGALINIUM DILWYNENSIS
SPINIDINIUM SPP.
VOZZHENNIKOVIA SPP.
SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
BACULATISPORITES SPP.
CYATHIDITES SPP.
EPHEDRIPITES SPP.
GLEICHENIIDITES SPP.
LAEVIGATOSPORITES SPP.
LYGISTEPOLLENITES BALMEI
LYGISTEPOLLENITES FLORINII
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PODOSPORITES MICROSACCATUS
PROTEACIDITES SPP.
STEREISPORITES ANTIQUASPORITES
TRICOLPITES SPP.

2345-50 METERS (DITCH SAMPLE)

AGE : EARLY PALEOCENE
RD2

ENVIRONMENT : NONMARINE

FAUNA & FLORA : MINOR EOCENE CAVINGS

FIGURE 5. BIOSTRATIGRAPHY OF TURRUM-2, TURRUM RESERVOIR

PRESERVATION : POOR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN

SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
CYATHIDITES SPP.
GAMBIERINA EDWARSII
GLEICHENIIDITES SPP.
LAEVIGATOSPORITES SPP.
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PODOSPORITES MICROSACCATUS
PROTEACIDITES ANGULALTUS
PROTEACIDITES SPP.
STEREISPORITES ANTIQUASPORITES
TRICOLPITES SPP.

2365.7 METERS (SIDE-WALL CORE)

AGE : INDETERMINATE

ENVIRONMENT : NONMARINE

PRESERVATION : VERY POOR

SPECIES: SPORES AND POLLEN
ARAUCARIACITES AUSTRALIS
AUSTALOPOLLIS OBSCURUS
CYATHIDITES SPP.
DILWYNITES GRANULATUS
GLEICHENIIDITES SPP.
HERKOSPORITES ELLIOTII
LYCOPODIUMSPORITES SPP.
LYGISTEPOLLENITES BALMEI
LYGISTEPOLLENITES FLORINII
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PROTEACIDITES ANGULALTUS
PROTEACIDITES SPP.
STEREISPORITES (TRIPUNCTISPORIS) SP.
STEREISPORITES ANTIQUASPORITES
VERRUCATOSPORITES SP. 3

FIGURE 5. BIOSTRATIGRAPHY OF TURRUM-2, TURRUM RESERVOIR

2365-70 METERS (DITCH SAMPLE)

AGE : EARLY PALEOCENE
RD2

ENVIRONMENT : NONMARINE

FAUNA & FLORA : MINOR EOCENE CAVINGS

PRESERVATION : POOR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN

SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
BACULATISPORITES SPP.
CYATHIDITES SPP.
GAMBIERINA EDWARSII
GLEICHENIIDITES SPP.
HERKOSPORITES ELLIOTII
LAEVIGATOSPORITES SPP.
LYGISTEPOLLENITES BALMEI
LYGISTEPOLLENITES FLORINII
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES MICROSACCATUS
PROTEACIDITES ANGULALTUS
PROTEACIDITES SPP.
STEREISPORITES ANTIQUASPORITES
TETRACOLPORITES VERRUCOSUS
TRICOLPITES SPP.
TRIORITES SP.

2385-90 METERS (DITCH SAMPLE)

AGE : INDETERMINATE

ENVIRONMENT : NONMARINE

FAUNA & FLORA : DK KEROGEN

PRESERVATION : POOR

SPECIES: OTHER
AMORPHOUS KEROGEN

FIGURE 5. BIOSTRATIGRAPHY OF TURRUM-2, TURRUM RESERVOIR

BIODEGRADED TERRESTRIAL
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN

SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
BACULATISPORITES SPP.
CYATHIDITES SPP.
EPHEDRIPITES SPP.
GLEICHENIIDITES SPP.
LAEVIGATOSPORITES SPP.
LYGISTEPOLLENITES BALMEI
LYGISTEPOLLENITES FLORINII
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PODOSPORITES MICROSACCATUS
PROTEACIDITES ANGULALTUS
PROTEACIDITES SPP.
STEREISPORITES ANTIQUASPORITES
TETRACOLPORITES VERRUCOSUS
TRICOLPITES SPP.

2399.9 METERS (SIDE-WALL CORE)

AGE : INDETERMINATE

ENVIRONMENT : NONMARINE

PRESERVATION : POOR

SPECIES: SPORES AND POLLEN
ARAUCARIACITES AUSTRALIS
AUSTALOPOLLIS OBSCURUS
BACULATISPORITES SPP.
CYATHIDITES SPP.
DILWYNITES GRANULATUS
GLEICHENIIDITES SPP.
HERKOSPORITES ELLIOTII
LAEVIGATOSPORITES SPP.
LYCOPODIUMSPORITES SPP.
LYGISTEPOLLENITES BALMEI
PERIPOROPOLLENITES POLYPORATUS
PEROMONOLETES DENSUS
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PODOSPORITES MICROSACCATUS
PROTEACIDITES ANGULALTUS

FIGURE 5. BIOSTRATIGRAPHY OF TURRUM-2, TURRUM RESERVOIR

PROTEACIDITES SPP.
STEREISPORITES (TRIPUNCTISPORIS) SP.
STEREISPORITES ANTIQUASPORITES
STEREISPORITES REGIUM
TRICOLPITES GILLII
TRICOLPITES SPP.
TRIORITES SP.

2400-5 METERS (DITCH SAMPLE)

AGE : INDETERMINATE

ENVIRONMENT : NONMARINE

FAUNA & FLORA : DK KEROGEN

PRESERVATION : POOR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN
DINOFLAGELLATES
APECTODINIUM SP. CF. A. SPP.
SPINIDINIUM SPP.
SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
BACULATISPORITES SPP.
CYATHIDITES SPP.
GLEICHENIIDITES SPP.
LAEVIGATOSPORITES SPP.
LYGISTEPOLLENITES BALMEI
LYGISTEPOLLENITES FLORINII
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PODOSPORITES MICROSACCATUS
PROTEACIDITES ANGULALTUS
PROTEACIDITES SPP.
TETRACOLPORITES VERRUCOSUS
TRICOLPITES SPP.

2465.4 METERS (SIDE-WALL CORE)

FIGURE 5. BIOSTRATIGRAPHY OF TURRUM-2, TURRUM RESERVOIR

AGE : INDETERMINATE

ENVIRONMENT : NONMARINE

PRESERVATION : VERY POOR

SPECIES: SPORES AND POLLEN
ARAUCARIACITES AUSTRALIS
AUSTALOPOLLIS OBSCURUS
BACULATISPORITES SPP.
CHOMOTRILETES SPP.
CYATHAEIDITES GIGANTIS
CYATHIDITES SPP.
DILWYNITES GRANULATUS
GLEICHENIIDITES SPP.
HERKOSPORITES ELLIOTII
LAEVIGATOSPORITES SPP.
LATROBOSPORITES OHAIENSIS
LYCOPODIUMSPORITES SPP.
LYGISTEPOLLENITES BALMEI
LYGISTEPOLLENITES FLORINII
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PODOSPORITES MICROSACCATUS
PROTEACIDITES ANGULALTUS
PROTEACIDITES SPP.
STEREISPORITES (TRIPUNCTISPORIS) SP.
STEREISPORITES ANTIQUASPORITES

2465-70 METERS (DITCH SAMPLE)

AGE : EARLY PALEOCENE
RE

ENVIRONMENT : MARGINAL MARINE-MARINE

FAUNA & FLORA : DARK KEROGEN

PRESERVATION : FAIR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN
DINOFLAGELLATES

FIGURE 5. BIOSTRATIGRAPHY OF TURRUM-2, TURRUM RESERVOIR

APECTODINIUM SP. CF. A. SPP.
CERODINIUM SP. CF. C. SPECIOSUM
CERODINIUM SPP.
DEFLANDREA SPP.
PALAEOCYSTODINIUM AUSTRALINUM
PALAEOCYSTODINIUM GOLZOWENSE
SENEGALINIUM DILWYNENSIS
SPINIDINIUM DENSISPINATUM
SPINIDINIUM SPP.
VOZZHENNIKOVIA SPP.

SPORES AND POLLEN

AUSTALOPOLLIS OBSCURUS
BACULATISPORITES SPP.
CYATHIDITES SPP.
GLEICHENIIDITES SPP.
LAEVIGATOSPORITES SPP.
LYGISTEPOLLENITES BALMEI
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES MICROSACCATUS
PROTEACIDITES ANGULALTUS
PROTEACIDITES SPP.
STEREISPORITES ANTIQUASPORITES
TETRACOLPORITES VERRUCOSUS
TRICOLPITES GILLII
TRICOLPITES SPP.

2480-85 METERS (DITCH SAMPLE)

AGE : E. E. PALEOC.-?LT. MAAST.
RF

ENVIRONMENT : MARGINAL MARINE

FAUNA & FLORA : DARK KEROGEN

PRESERVATION : POOR

SPECIES: OTHER

AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN

DINOFLAGELLATES

CERODINIUM DARTMOORIA (SENSU WILSON, 1988)
CERODINIUM SPP.
SPINIDINIUM DENSISPINATUM

FIGURE 5. BIOSTRATIGRAPHY OF TURRUM-2, TURRUM RESERVOIR

VOZZHENNIKOVIA SPP.
SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
CYATHIDITES SPP.
EPHEDRIPITES SPP.
GLEICHENIIDITES SPP.
LAEVIGATOSPORITES SPP.
LYGISTEPOLLENITES FLORINII
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES MICROSACCATUS
PROTEACIDITES ANGULALTUS
PROTEACIDITES SPP.
STEREISPORITES ANTIQUASPORITES
TETRACOLPORITES VERRUCOSUS
TRICOLPITES SP. CF. T. CONFESSUS
TRICOLPITES GILLII
TRICOLPITES SPP.

2495-2500 METERS (DITCH SAMPLE)

AGE : E. E. PALEOC.-?LT. MAAST.
RF

ENVIRONMENT : MARGINAL MARINE

FAUNA & FLORA : DARK KEROGEN

PRESERVATION : POOR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN
DINOFLAGELLATES
CERODINIUM SP. CF. C. SPECIOSUM
CERODINIUM SPP.
SENEGALINIUM DILWYNENSIS
SPINIDINIUM DENSISPINATUM
SPINIDINIUM SPP.
VOZZHENNIKOVIA SPP.
SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
BACULATISPORITES SPP.
CYATHIDITES SPP.
EPHEDRIPITES SPP.

FIGURE 5. BIOSTRATIGRAPHY OF TURRUM-2, TURRUM RESERVOIR

GLEICHENIIDITES SPP.
LAEVIGATOSPORITES SPP.
LYGISTEPOLLENITES BALMEI
NOTHOFAGIDITES SPP.
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PODOSPORITES MICROSACCATUS
PROTEACIDITES ANGULALTUS
PROTEACIDITES SPP.
STEREISPORITES (TRIPUNCTISPORIS) SP.
STEREISPORITES ANTIQUASPORITES
TETRACOLPORITES VERRUCOSUS
TRICOLPITES SP. CF. T. CONFESSUS
TRICOLPITES GILLII
TRICOLPITES SPP.

2498.3 METERS (SIDE-WALL CORE)

AGE : E. E. PALEOC.-?LT. MAAST.
RF

ENVIRONMENT : NONMARINE

PRESERVATION : VERY POOR

SPECIES: DINOFLAGELLATES
CERODINIUM SPP.
DEFLANDREA SPP.
UNDIFFERENTIATED FORMS
SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
BACULATISPORITES SPP.
CYATHIDITES SPP.
DILWYNITES GRANULATUS
GLEICHENIIDITES SPP.
HERKOSPORITES ELLIOTII
LAEVIGATOSPORITES SPP.
LATROBOSPORITES CRASSUS
LATROBOSPORITES OHAIENSIS
LYGISTEPOLLENITES BALMEI
NOTHOFAGIDITES BRACHYSPINULOSUS
PHYLLOCLADIDITES MAWSONII
PHYLLOCLADIDITES MAWSONII FORM VERRUCOSUS
PHYLLOCLADIDITES RETICULOSACCATUS
PODOCARPIDITES SPP.
PODOSPORITES MICROSACCATUS
PROTEACIDITES ANGULALTUS
PROTEACIDITES SPP.
STEREISPORITES (TRIPUNCTISPORIS) SP.

FIGURE 5. BIOSTRATIGRAPHY OF TURRUM-2, TURRUM RESERVOIR

STEREISPORITES ANTIQUASPORITES
TRICOLPITES SP. CF. T. CONFESSUS
TRICOLPITES SPP.
TRICOLPORITES SP. CF. T. LILLIEI

2530.3 METERS (SIDE-WALL CORE)

AGE : E. E. PALEOC.-?LT. MAAST.
RF

ENVIRONMENT : NONMARINE

FAUNA & FLORA : MUD CONTAM

PRESERVATION : VERY POOR-POOR

SPECIES: SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
CYATHIDITES SPP.
GLEICHENIIDITES SPP.
HERKOSPORITES ELLIOTII
LAEVIGATOSPORITES SPP.
LYGISTEPOLLENITES BALMEI
NOTHOFAGIDITES ENDURUS
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES MICROSACCATUS
PROTEACIDITES ANGULALTUS
PROTEACIDITES ANNULARIS
PROTEACIDITES SPP.
STEREISPORITES (TRIPUNCTISPORIS) SP.
TRICOLPITES SP. CF. T. CONFESSUS
TRICOLPITES GILLII
TRICOLPITES SPP.

2530-35 METERS (DITCH SAMPLE)

AGE : E. E. PALEOC.-?LT. MAAST.
RF

ENVIRONMENT : NONMARINE

FAUNA & FLORA : DARK KEROGEN

PRESERVATION : POOR

SPECIES: OTHER

FIGURE 5. BIOSTRATIGRAPHY OF TURRUM-2, TURRUM RESERVOIR

AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN

SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
CYATHIDITES SPP.
GLEICHENIIDITES SPP.
LATROBOSPORITES OHAIENSIS
LYGISTEPOLLENITES BALMEI
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES MICROSACCATUS
PROTEACIDITES ANGULALTUS
PROTEACIDITES SPP.
STEREISPORITES ANTIQUASPORITES
TRICOLPITES CONFESSUS
TRICOLPITES SPP.
TRICOLPORITES SPP.

2554.7 METERS (SIDE-WALL CORE)

AGE : INDETERMINATE

ENVIRONMENT : NONMARINE

PRESERVATION : VERY POOR

SPECIES: SPORES AND POLLEN
CYATHAEIDITES GIGANTIS
GLEICHENIIDITES SPP.
HALORAGACIDITES HARRISII
HERKOSPORITES ELLIOTII
LAEVIGATOSPORITES SPP.
LYGISTEPOLLENITES BALMEI
NOTHOFAGIDITES ENDURUS
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PROTEACIDITES ANGULALTUS
PROTEACIDITES SP.
PROTEACIDITES SPP.
STEREISPORITES (TRIPUNCTISPORIS) SP.
STEREISPORITES ANTIQUASPORITES
TRICOLPITES GILLII
TRICOLPITES PHILLIPSII
TRICOLPITES SPP.

FIGURE 5. BIOSTRATIGRAPHY OF TURRUM-2, TURRUM RESERVOIR

2555-60 METERS (DITCH SAMPLE)

AGE : E. E. PALEOC.-?LT. MAAST.
RF

ENVIRONMENT : NONMARINE

FAUNA & FLORA : DARK KEROGEN

PRESERVATION : POOR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN
SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
BACULATISPORITES SPP.
CYATHIDITES SPP.
EPHEDRIPITES SPP.
GLEICHENIIDITES SPP.
LAEVIGATOSPORITES SPP.
NOTHOFAGIDITES SPP.
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PODOSPORITES MICROSACCATUS
PROTEACIDITES ANGULALTUS
PROTEACIDITES SPP.
STEREISPORITES (TRIPUNCTISPORIS) SP.
STEREISPORITES ANTIQUASPORITES
TETRACOLPORITES VERRUCOSUS
TRICOLPITES SP. CF. T. CONFESSUS
TRICOLPITES GILLII
TRICOLPITES PHILLIPSII
TRICOLPITES SPP.

2588.2 METERS (SIDE-WALL CORE)

AGE : PROB. L. MAASTRICHTIAN
RG

ENVIRONMENT : MARGINAL-NONMARINE

PRESERVATION : VERY POOR-FAIR

SPECIES: DINOFLAGELLATES

FIGURE 5. BIOSTRATIGRAPHY OF TURRUM-2, TURRUM RESERVOIR

CORDOSPHAERIDIUM SPP.
HYSTRICHOSPHAERIDIUM SPP.
SPINIDINIUM SP. CF. S. DENSISPINATUM
SPINIDINIUM SPP.
SPINIFERITES SPP.
UNDIFFERENTIATED FORMS

SPORES AND POLLEN
CLAVIFERA TRIPLEX
CYATHIDITES SPP.
GAMBIERINA SP. CF. G. EDWARSII
GLEICHENIIDITES SPP.
LAEVIGATOSPORITES SPP.
LYGISTEPOLLENITES FLORINII
NOTHOFAGIDITES EMARCUDUS/HETERUS
NOTHOFAGIDITES ENDURUS
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PROTEACIDITES SP.
PROTEACIDITES SPP.
STEREISPORITES ANTIQUASPORITES
STEREISPORITES REGIUM

2623-26 METERS (DITCH SAMPLE)

AGE : PROB. L. MAASTRICHTIAN
RG

ENVIRONMENT : MARGINAL-NONMARINE

FAUNA & FLORA : DK KEROGEN, SOME DOWNHOLE CONTAM.

PRESERVATION : POOR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN

DINOFLAGELLATES
GLAPHYROCYSTA SPP.
PALAEOCYSTODINIUM SPP.
SPINIDINIUM SP. CF. S. SPP.

SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
CYATHIDITES SPP.
EPHEDRIPITES SPP.

FIGURE 5. BIOSTRATIGRAPHY OF TURRUM-2, TURRUM RESERVOIR

GAMBIERINA RUDATA
GLEICHENIIDITES SPP.
LAEVIGATOSPORITES SPP.
LYGISTEPOLLENITES BALMEI
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES MICROSACCATUS
PROTEACIDITES ANGULALTUS
PROTEACIDITES SPP.
STEREISPORITES ANTIQUASPORITES
STEREISPORITES REGIUM
TRICOLPITES SP. CF. T. CONFESSUS
TRICOLPITES GILLII
TRICOLPITES PHILLIPSII
TRICOLPITES SPP.
TRICOLPORITES SPP.

2647.1 METERS (SIDE-WALL CORE)

AGE : INDETERMINATE

ENVIRONMENT : MARGINAL-NONMARINE

PRESERVATION : VERY POOR-POOR

SPECIES: OTHER
BIODEGRADED TERRESTRIAL
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
WOODY-COALY KEROGEN
*** NOTSEC *** SPECIES NOT ON FILE ***
DINOFLAGELLATES
CORDOSPHAERIDIUM FIBROSPINOSUM
SPORES AND POLLEN
CYATHIDITES SPP.
GLEICHENIIDITES SPP.
HERKOSPORITES ELLIOTII
ISCHYOSPORITES IRREGULARIS
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PROTEACIDITES SPP.
STEREISPORITES ANTIQUASPORITES
STEREISPORITES REGIUM
TRICOLPITES SPP.

2665.3 METERS (SIDE-WALL CORE)

FIGURE 5. BIOSTRATIGRAPHY OF TURRUM-2, TURRUM RESERVOIR

AGE : LATE MAASTRICHTIAN
MA

ENVIRONMENT : MARGINAL-NONMARINE

PRESERVATION : POOR

SPECIES: OTHER
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
WOODY-COALY KEROGEN
*** NOTSEC *** SPECIES NOT ON FILE ***
DINOFLAGELLATES
UNDIFFERENTIATED FORMS
SPORES AND POLLEN
ARAUCARIACITES AUSTRALIS
AUSTALOPOLLIS OBSCURUS
BACULATISPORITES SPP.
CLAVIFERA TRIPLEX
CYATHAEIDITES GIGANTIS
CYATHIDITES SPP.
DILWYNITES GRANULATUS
GAMBIERINA SP. CF. G. EDWARSII
GAMBIERINA RUDATA
GLEICHENIIDITES SPP.
HERKOSPORITES ELLIOTII
LATROBOSPORITES OHAIENSIS
LYCOPODIUMSPORITES SPP.
LYGISTEPOLLENITES FLORINII
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PODOSPORITES MICROSACCATUS
PROTEACIDITES SP. CF. P. AMOLOSEXINUS
PROTEACIDITES MINUTUS
PROTEACIDITES SPP.
STEREISPORITES ANTIQUASPORITES
TETRACOLPORITES SP. CF. T. VERRUCOSUS
TRICOLPITES CONFESSUS
TRICOLPITES GILLII
TRICOLPITES RETICULATUS
TRICOLPITES SPP.
TRICOLPORITES LILLIEI

APPENDIX E

Age Summary and Data

FIGURE 6. BIOSTRATIGRAPHY OF MARLIN-4, TURRUM RESERVOIR

A G E S U M M A R Y

(DEPTH IN METERS)

NO SAMPLES ABOVE A DEPTH OF 1807.4 METERS

1807.4	EARLY OLIG-LATE EOCENE P. TUB.-N. ASPERUS
1831.8	PROB MIDDLE EOCENE N. ASPERUS
1859.2	EARLY EOCENE? P. ASPEROPOLUS?
2077.4	EARLY EOCENE SZ
2185.3	E. LATE PALEOCENE? RC?
2228.0	L. EARLY PALEOCENE RD1
2256.3	INDETERMINATE
2287.7	EARLY PALEOCENE? RD2?
2348.7	EARLY PALEOCENE? RE?
2394.1	E. E. PALEOC.-?LT. MAAST. RF
2496.2	PROB. L. MAASTRICHTIAN? RG?
2514.5	PROB. L. MAASTRICHTIAN RG
2561.4	LATE MAASTRICHTIAN? MA?
2589.5	LATE MAASTRICHTIAN MA
2589.5	BOTTOM WELL SAMPLE EXAMINED

FIGURE 6. BIOSTRATIGRAPHY OF MARLIN-4, TURRUM RESERVOIR

E N V I R O N M E N T S U M M A R Y

(DEPTH IN METERS)

NO SAMPLES ABOVE A DEPTH OF 1807.4 METERS

1807.4	MARINE
1868.3	MARGINAL MARINE
1873.8	MARINE
2077.4	NONMARINE
2185.3	MARGINAL MARINE
2228.0	MARINE
2256.3	NONMARINE
2348.7	MARGINAL MARINE
2366.4	MARGINAL MARINE-MARINE
2394.1	NONMARINE
2496.2	NONMARINE-MARGINAL MARINE
2514.5	MARGINAL MARINE
2561.4	NONMARINE
2589.5	BOTTOM WELL SAMPLE EXAMINED

FIGURE 6. BIOSTRATIGRAPHY OF MARLIN-4, TURRUM RESERVOIR

1807.4 METERS (SIDE-WALL CORE)

AGE : EARLY OLIG-LATE EOCENE
P. TUB.-N. ASPERUS

ENVIRONMENT : MARINE

PRESERVATION : FAIR-POOR

SPECIES: OTHER
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (SPORE-POLLEN)
WOODY-COALY KEROGEN
DINOFLAGELLATES
DISTATODINIUM CRATERUM
MELITASPHAERIDIUM SP. CF. M. PSEUDORECURVATUM
OPERCULODINIUM CENTROCARPUM
SPINIFERITES SPP.
UNDIFFERENTIATED FORMS
SPORES AND POLLEN
CUPANIEIDITES ORTHOTEICHUS
CYATHIDITES SPP.
HALORAGACIDITES HARRISII
NOTHOFAGIDITES ASPERUS
NOTHOFAGIDITES EMARCUDUS/HETERUS
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PROTEACIDITES SPP.
STEREISPORITES ANTIQUASPORITES

1831.8 METERS (SIDE-WALL CORE)

AGE : PROB MIDDLE EOCENE
N. ASPERUS

ENVIRONMENT : MARINE

FAUNA & FLORA : BROKEN DINOS

PRESERVATION : VERY POOR

SPECIES: OTHER
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (SPORE-POLLEN)
WOODY-COALY KEROGEN
DINOFLAGELLATES
DISTATODINIUM CRATERUM
OPERCULODINIUM CENTROCARPUM
SPINIFERITES SPP.

FIGURE 6. BIOSTRATIGRAPHY OF MARLIN-4, TURRUM RESERVOIR

UNDIFFERENTIATED FORMS
SPORES AND POLLEN
HALORAGACIDITES HARRISII
NOTHOFAGIDITES DEMINUTUS
PROTEACIDITES ANNULARIS
PROTEACIDITES PACHYPOLUS
PROTEACIDITES SPP.

1837.8 METERS (SIDE-WALL CORE)

AGE : PROB MIDDLE EOCENE
N. ASPERUS

ENVIRONMENT : MARINE

FAUNA & FLORA : BROKEN DINOS

PRESERVATION : VERY POOR

SPECIES: OTHER
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (SPORE-POLLEN)
WOODY-COALY KEROGEN
DINOFLAGELLATES
DEFLANDREA SP. CF. D. HETEROPHLYCTA
OPERCULODINIUM CENTROCARPUM
SPINIFERITES SPP.
SPORES AND POLLEN
BACULATISPORITES SPP.
CYATHIDITES SPP.
HALORAGACIDITES HARRISII
NOTHOFAGIDITES DEMINUTUS
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PROTEACIDITES ASPEROPOLUS
PROTEACIDITES SPP.

1844.0 METERS (SIDE-WALL CORE)

AGE : PROB MIDDLE EOCENE
N. ASPERUS

ENVIRONMENT : MARINE

PRESERVATION : FAIR-GOOD

SPECIES: OTHER

FIGURE 6. BIOSTRATIGRAPHY OF MARLIN-4, TURRUM RESERVOIR

DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (SPORE-POLLEN)
WOODY-COALY KEROGEN

DINOFLAGELLATES
AREOSPHAERIDIUM SP. CF. A. DIKTYOPLOKUS
AREOSPHAERIDIUM FENESTRATUM
DEFLANDREA SPP.
GOCHTODINIUM SP. CF. G. SPINULA
SENEGALINIUM SP. CF. S. DILWYNENSIS
SPINIDINIUM SPP.
SPINIFERITES SPP.
THALASSIPHORA SP. CF. T. PATULA
UNDIFFERENTIATED FORMS

SPORES AND POLLEN
CYATHIDITES SPP.
ERICIPITES SPP.
GLEICHENIIDITES SPP.
HALORAGACIDITES HARRISII
LYGISTEPOLLENITES FLORINII
MALVACILPOLLIS DIVERSUS
NOTHOFAGIDITES DEMINUTUS
NOTHOFAGIDITES EMARCUDUS/HETERUS
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PROTEACIDITES PACHYPOLUS
PROTEACIDITES SPP.
STEREISPORITES ANTIQUASPORITES

1859.2 METERS (SIDE-WALL CORE)

AGE : EARLY EOCENE?
P. ASPEROPOLUS?

ENVIRONMENT : MARINE

PRESERVATION : FAIR-GOOD

SPECIES: OTHER
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
WOODY-COALY KEROGEN

DINOFLAGELLATES
ACRITARCH SP. 5
APECTODINIUM SP. CF. A. HOMOMORPHUM
AREOSPHAERIDIUM FENESTRATUM
DEFLANDREA SP. CF. D. MEDCALFII
DEFLANDREA SPP.

FIGURE 6. BIOSTRATIGRAPHY OF MARLIN-4, TURRUM RESERVOIR

SPINIFERITES SPP.
SPORES AND POLLEN
CYATHIDITES SPP.
HALORAGACIDITES HARRISII
LYGISTEPOLLENITES FLORINII
NOTHOFAGIDITES DEMINUTUS
NOTHOFAGIDITES FLEMINGII
NOTHOFAGIDITES GONIATUS
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PROTEACIDITES ANNULARIS
PROTEACIDITES SPP.
STEREISPORITES (TRIPUNCTISPORIS) SP.
STEREISPORITES ANTIQUASPORITES

1868.3 METERS (CONVENTIONAL CORE)

AGE : EARLY EOCENE?
P. ASPEROPOLUS?

ENVIRONMENT : MARGINAL MARINE

PRESERVATION : FAIR-GOOD

SPECIES: OTHER
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
WOODY-COALY KEROGEN
DINOFLAGELLATES
ACRITARCH SP. 5
APECTODINIUM HOMOMORPHUM
AREOSPHAERIDIUM SP. CF. A. FENESTRATUM
UNDIFFERENTIATED FORMS
SPORES AND POLLEN
CYATHIDITES SPP.
GLEICHENIIDITES SPP.
HALORAGACIDITES HARRISII
LILIACIDITES SP.
LYGISTEPOLLENITES FLORINII
MALVACILPOLLIS DIVERSUS
NOTHOFAGIDITES DEMINUTUS
NOTHOFAGIDITES EMARCUDUS/HETERUS
NOTHOFAGIDITES FLEMINGII
NOTHOFAGIDITES GONIATUS
PERIPOROPOLLENITES DEMARCATUS
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS

FIGURE 6. BIOSTRATIGRAPHY OF MARLIN-4, TURRUM RESERVOIR

PROTEACIDITES ANNULARIS
PROTEACIDITES CRASSUS
PROTEACIDITES PACHYPOLUS
PROTEACIDITES SPP.

1873.8 METERS (CONVENTIONAL CORE)

AGE : EARLY EOCENE?
P. ASPEROPOLUS?

ENVIRONMENT : MARINE

PRESERVATION : FAIR-GOOD

SPECIES: OTHER
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
WOODY-COALY KEROGEN
DINOFLAGELLATES
DEFLANDREA FLOUNDERENSIS
OPERCULODINIUM CENTROCARPUM
SPINIFERITES SPP.
UNDIFFERENTIATED FORMS
SPORES AND POLLEN
HALORAGACIDITES HARRISII
NOTHOFAGIDITES DEMINUTUS
PODOCARPIDITES SPP.
PROTEACIDITES SPP.

1886.6 METERS (SIDE-WALL CORE)

AGE : EARLY EOCENE?
P. ASPEROPOLUS?

ENVIRONMENT : MARINE

PRESERVATION : FAIR-GOOD

SPECIES: OTHER
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
WOODY-COALY KEROGEN
DINOFLAGELLATES

FIGURE 6. BIOSTRATIGRAPHY OF MARLIN-4, TURRUM RESERVOIR

APECTODINIUM HOMOMORPHUM
HOMOTRYBLIUM SP. CF. H. ABBREVIATUM
UNDIFFERENTIATED FORMS

SPORES AND POLLEN
ERICIPITES SPP.
HALORAGACIDITES HARRISII
MALVACILPOLLIS SUBTILIS
NOTHOFAGIDITES ASPERUS
NOTHOFAGIDITES DEMINUTUS
NOTHOFAGIDITES FLEMINGII
NOTHOFAGIDITES GONIATUS
PERIPOROPOLLENITES DEMARCATUS
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
POLYCOLPITES ESOBALTEUS
PROTEACIDITES SPP.

2077.4 METERS (SIDE-WALL CORE)

AGE : EARLY EOCENE
SZ

ENVIRONMENT : NONMARINE

PRESERVATION : FAIR-GOOD

SPECIES: OTHER
BIODEGRADED TERRESTRIAL
HERBACEOUS KEROGEN (SPORE-POLLEN)
WOODY-COALY KEROGEN

SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
CYATHAEIDITES GIGANTIS
CYATHIDITES SPP.
GAMBIERINA RUDATA
GLEICHENIIDITES SPP.
HALORAGACIDITES HARRISII
LAEVIGATOSPORITES SPP.
LYGISTEPOLLENITES BALMEI
NOTHOFAGIDITES EMARCUDUS/HETERUS
NOTHOFAGIDITES ENDURUS
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES MICROSACCATUS
PROTEACIDITES SP. CF. P. ANGULALTUS
PROTEACIDITES SPP.
RETITRICOLPITES SPP.
RUGULATISPORITES MALLATUS
SCHIZOCOLPUS MARLINENSIS

FIGURE 6. BIOSTRATIGRAPHY OF MARLIN-4, TURRUM RESERVOIR

STEREISPORITES (TRIPUNCTISPORIS) SP.
STEREISPORITES ANTIQUASPORITES
TRICOLPITES GILLII
TRICOLPITES SPP.
TRICOLPORITES SP. 120

2185.3 METERS (SIDE-WALL CORE)

AGE : E. LATE PALEOCENE?
RC?

ENVIRONMENT : MARGINAL MARINE

PRESERVATION : VERY POOR

SPECIES: OTHER
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (SPORE-POLLEN)
WOODY-COALY KEROGEN
DINOFLAGELLATES
CERODINIUM SP. CF. C. SPECIOSUM
GLAPHYROCYSTA RETIINTEXTA
GLAPHYROCYSTA SPP.
SPINIFERITES SPP.
SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
CYATHAEIDITES GIGANTIS
CYATHIDITES SPP.
ERICIPITES SPP.
GLEICHENIIDITES SPP.
LAEVIGATOSPORITES SPP.
LYGISTEPOLLENITES BALMEI
LYGISTEPOLLENITES FLORINII
NOTHOFAGIDITES ENDURUS
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PODOSPORITES MICROSACCATUS
PROTEACIDITES ANGULALTUS
PROTEACIDITES SP. CF. P. ANNULARIS
PROTEACIDITES SPP.
STEREISPORITES (TRIPUNCTISPORIS) SP.
STEREISPORITES ANTIQUASPORITES
TRICOLPITES SPP.

2228.0 METERS (SIDE-WALL CORE)

FIGURE 6. BIOSTRATIGRAPHY OF MARLIN-4, TURRUM RESERVOIR

AGE : L. EARLY PALEOCENE
RD1

ENVIRONMENT : MARINE

PRESERVATION : VERY POOR

SPECIES: OTHER
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (SPORE-POLLEN)
WOODY-COALY KEROGEN

DINOFLAGELLATES
ACHOMOSPHAERA SP.
CERODINIUM SP. CF. C. SPECIOSUM
CORDOSPHAERIDIUM FIBROSPINOSUM
CORDOSPHAERIDIUM SPP.
DEFLANDREA SP. CF. D. MEDCALFII
DEFLANDREA SPP.
FIBROCYSTA BIPOLARIS
GLAPHYROCYSTA RETIINTEXTA
GLAPHYROCYSTA SPP.
PALAEOCYSTODINIUM GOLZOWENSE
PALAEOPERIDINIUM PYROPHORUM
SENEGALINIUM DILWYNENSIS
SPINIDINIUM SP. CF. S. MACMURDOENSE
SPINIDINIUM SPP.
VOZZHENNIKOVIA ANGULATA
VOZZHENNIKOVIA SP.

SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
CYATHIDITES SPP.
DILWYNITES TUBERCULATUS
GAMBIERINA RUDATA
GLEICHENIIDITES SPP.
LYGISTEPOLLENITES BALMEI
LYGISTEPOLLENITES FLORINII
NOTHOFAGIDITES ENDURUS
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PROTEACIDITES ANGULALTUS
PROTEACIDITES SPP.
STEREISPORITES ANTIQUASPORITES

2256.3 METERS (SIDE-WALL CORE)

AGE : INDETERMINATE

ENVIRONMENT : NONMARINE

FIGURE 6. BIOSTRATIGRAPHY OF MARLIN-4, TURRUM RESERVOIR

PRESERVATION : FAIR

SPECIES: OTHER
- AMORPHOUS KEROGEN
- BIODEGRADED TERRESTRIAL
- HERBACEOUS KEROGEN (CUTICLE)
- HERBACEOUS KEROGEN (SPORE-POLLEN)
- WOODY-COALY KEROGEN

SPORES AND POLLEN
- AUSTALOPOLLIS OBSCURUS
- BACULATISPORITES SPP.
- CYATHIDITES SPP.
- GLEICHENIIDITES SPP.
- HERKOSPORITES ELLIOTII
- LAEVIGATOSPORITES SPP.
- LYGISTEPOLLENITES BALMEI
- LYGISTEPOLLENITES FLORINII
- NOTHOFAGIDITES EMARCUDUS/HETERUS
- PHYLLOCLADIDITES MAWSONII
- PODOCARPIDITES SPP.
- PODOSPORITES ANTARCTICUS
- PODOSPORITES MICROSACCATUS
- PROTEACIDITES SPP.
- STEREISPORITES ANTIQUASPORITES
- TRICOLPITES SPP.
- TRICOLPORITES SP. 120
- TRICOLPORITES SPP.

2287.7 METERS (SIDE-WALL CORE)

AGE : EARLY PALEOCENE?
RD2?

ENVIRONMENT : NONMARINE

PRESERVATION : POOR-FAIR

SPECIES: OTHER
- AMORPHOUS KEROGEN
- BIODEGRADED TERRESTRIAL
- HERBACEOUS KEROGEN (CUTICLE)
- HERBACEOUS KEROGEN (SPORE-POLLEN)
- WOODY-COALY KEROGEN

SPORES AND POLLEN
- AUSTALOPOLLIS OBSCURUS
- CYATHAEIDITES GIGANTIS
- CYATHIDITES SPP.
- LAEVIGATOSPORITES SPP.
- LYGISTEPOLLENITES BALMEI
- LYGISTEPOLLENITES FLORINII

FIGURE 6. BIOSTRATIGRAPHY OF MARLIN-4, TURRUM RESERVOIR

PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PROTEACIDITES ANGULALTUS
PROTEACIDITES SPP.
STEREISPORITES ANTIQUASPORITES
TRICOLPITES SPP.
TRICOLPORITES SP. 120
TRICOLPORITES SPP.

2348.7 METERS (SIDE-WALL CORE)

AGE : EARLY PALEOCENE?
RE?

ENVIRONMENT : MARGINAL MARINE

PRESERVATION : FAIR

SPECIES: OTHER
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
WOODY-COALY KEROGEN
DINOFLAGELLATES
APECTODINIUM SP. CF. A. SPP.
DEFLANDREA SPP.
GINGINODINIUM SP. CF. G. TABULATUM
SENEGALINIUM DILWYNENSIS
SPINIDINIUM SPP.
UNDIFFERENTIATED FORMS
VOZZHENNIKOVIA APERTURA
VOZZHENNIKOVIA SP.
SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
CYATHAEIDITES GIGANTIS
CYATHIDITES SPP.
GAMBIERINA RUDATA
GLEICHENIIDITES SPP.
LAEVIGATOSPORITES SPP.
LYGISTEPOLLENITES BALMEI
LYGISTEPOLLENITES FLORINII
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PROTEACIDITES ANGULALTUS
PROTEACIDITES SPP.
STEREISPORITES (TRIPUNCTISPORIS) SP.
STEREISPORITES ANTIQUASPORITES

FIGURE 6. BIOSTRATIGRAPHY OF MARLIN-4, TURRUM RESERVOIR

2366.4 METERS (SIDE-WALL CORE)

AGE : EARLY PALEOCENE?
RE?

ENVIRONMENT : MARGINAL MARINE-MARINE

PRESERVATION : FAIR

SPECIES: OTHER
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
WOODY-COALY KEROGEN
DINOFLAGELLATES
CERODINIUM SP. CF. C. SPECIOSUM
DEFLANDREA SPP.
GINGINODINIUM TABULATUM
SENEGALINIUM DILWYNENSIS
SPINIDINIUM DENSISPINATUM
SPINIDINIUM SPP.
VOZZHENNIKOVIA ANGULATA
VOZZHENNIKOVIA SP.
SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
CYATHAEIDITES GIGANTIS
CYATHIDITES SPP.
GAMBIERINA EDWARSII
GLEICHENIIDITES SPP.
HERKOSPORITES ELLIOTII
LAEVIGATOSPORITES SPP.
LYGISTEPOLLENITES BALMEI
LYGISTEPOLLENITES FLORINII
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PROTEACIDITES ANGULALTUS
PROTEACIDITES SPP.
STEREISPORITES ANTIQUASPORITES
TRICOLPITES GILLII

2394.1 METERS (SIDE-WALL CORE)

AGE : E. E. PALEOC.-?LT. MAAST.
RF

ENVIRONMENT : NONMARINE

PRESERVATION : POOR

FIGURE 6. BIOSTRATIGRAPHY OF MARLIN-4, TURRUM RESERVOIR

SPECIES: OTHER
BIODEGRADED TERRESTRIAL
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
WOODY-COALY KEROGEN
SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
CYATHAEIDITES GIGANTIS
CYATHIDITES SPP.
GLEICHENIIDITES SPP.
HERKOSPORITES ELLIOTII
LAEVIGATOSPORITES SPP.
LYGISTEPOLLENITES BALMEI
LYGISTEPOLLENITES FLORINII
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PROTEACIDITES ANGULALTUS
PROTEACIDITES SPP.
STEREISPORITES ANTIQUASPORITES
TRICOLPITES SP. CF. T. CONFESSUS
TRICOLPITES SPP.

2406.9 METERS (SIDE-WALL CORE)

AGE : E. E. PALEOC.-?LT. MAAST.
RF

ENVIRONMENT : NONMARINE

PRESERVATION : POOR

SPECIES: OTHER
BIODEGRADED TERRESTRIAL
BOTRYOCCUS SPP.
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
WOODY-COALY KEROGEN
SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
CYATHAEIDITES GIGANTIS
CYATHIDITES SPP.
GAMBIERINA EDWARSII
GAMBIERINA RUDATA
GLEICHENIIDITES SPP.
LAEVIGATOSPORITES SPP.
PEROMONOLETES DENSUS
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PROTEACIDITES ANGULALTUS
PROTEACIDITES SPP.

FIGURE 6. BIOSTRATIGRAPHY OF MARLIN-4, TURRUM RESERVOIR

STEREISPORITES (TRIPUNCTISPORIS) SP.
STEREISPORITES ANTIQUASPORITES
TRICOLPORITES SPP.
TRILETE SPORES, SMOOTH (UNDIFF.)

2435.2 METERS (SIDE-WALL CORE)

AGE : E. E. PALEOC.-?LT. MAAST.
RF

ENVIRONMENT : NONMARINE

PRESERVATION : POOR

SPECIES: OTHER
BIODEGRADED TERRESTRIAL
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
WOODY-COALY KEROGEN
SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
GLEICHENIIDITES SPP.
HERKOSPORITES ELLIOTII
LAEVIGATOSPORITES SPP.
LYGISTEPOLLENITES BALMEI
LYGISTEPOLLENITES FLORINII
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PODOSPORITES MICROSACCATUS
PROTEACIDITES ANGULALTUS
PROTEACIDITES SPP.
STEREISPORITES (TRIPUNCTISPORIS) SP.
TRICOLPITES GILLII

2461.5 METERS (SIDE-WALL CORE)

AGE : E. E. PALEOC.-?LT. MAAST.
RF

ENVIRONMENT : NONMARINE

FAUNA & FLORA : COAL

PRESERVATION : POOR

SPECIES: OTHER

FIGURE 6. BIOSTRATIGRAPHY OF MARLIN-4, TURRUM RESERVOIR

BIODEGRADED TERRESTRIAL
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
WOODY-COALY KEROGEN
SPORES AND POLLEN
CYATHIDITES SPP.
GLEICHENIIDITES SPP.
LAEVIGATOSPORITES SPP.
LATROBOSPORITES CRASSUS
LATROBOSPORITES OHAIENSIS
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PROTEACIDITES SPP.
TRICOLPITES GILLII
TRICOLPITES SPP.

2466.3 METERS (SIDE-WALL CORE)

AGE : E. E. PALEOC.-?LT. MAAST.
RF

ENVIRONMENT : NONMARINE

PRESERVATION : POOR-FAIR

SPECIES: OTHER
BIODEGRADED TERRESTRIAL
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
WOODY-COALY KEROGEN
SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
BACULATISPORITES SPP.
CYATHIDITES SPP.
DILWYNITES TUBERCULATUS
GLEICHENIIDITES SPP.
LAEVIGATOSPORITES SPP.
NOTHOFAGIDITES ENDURUS
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PROTEACIDITES ANGULALTUS
PROTEACIDITES SPP.
STEREISPORITES (TRIPUNCTISPORIS) SP.
STEREISPORITES REGIUM
TETRACOLPORITES VERRUCOSUS
TRICOLPITES SP. CF. T. CONFESSUS
TRICOLPITES GILLII
TRICOLPITES SPP.
TRICOLPORITES SP. 120

FIGURE 6. BIOSTRATIGRAPHY OF MARLIN-4, TURRUM RESERVOIR

TRICOLPORITES SPP.

2496.2 METERS (SIDE-WALL CORE)

AGE : PROB. L. MAASTRICHTIAN?
RG?

ENVIRONMENT : NONMARINE-MARGINAL MARINE

PRESERVATION : POOR-FAIR

SPECIES: OTHER
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
WOODY-COALY KEROGEN
DINOFLAGELLATES
CORDOSPHAERIDIUM SPP.
SENEGALINIUM DILWYNENSIS
UNDIFFERENTIATED FORMS
SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
BACULATISPORITES SPP.
CYATHIDITES SPP.
DILWYNITES TUBERCULATUS
GAMBIERINA RUDATA
GLEICHENIIDITES SPP.
LAEVIGATOSPORITES SPP.
LATROBOSPORITES OHAIENSIS
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PROTEACIDITES SPP.
STEREISPORITES ANTIQUASPORITES
TRICOLPITES GILLII
TRICOLPITES SPP.

2514.5 METERS (SIDE-WALL CORE)

AGE : PROB. L. MAASTRICHTIAN
RG

ENVIRONMENT : MARGINAL MARINE

FAUNA & FLORA : ABUND PYRITE SCARS, REWKINGS

FIGURE 6. BIOSTRATIGRAPHY OF MARLIN-4, TURRUM RESERVOIR

PRESERVATION : VERY POOR

SPECIES: OTHER
- BIODEGRADED TERRESTRIAL
- DINOFLAGELLATES-ACRITARCHS
- HERBACEOUS KEROGEN (CUTICLE)
- HERBACEOUS KEROGEN (SPORE-POLLEN)
- WOODY-COALY KEROGEN

DINOFLAGELLATES
- CORDOSPHAERIDIUM SPP.
- HYSTRICHOSPHAERIDIUM SP.
- PALAEOCYSTODINIUM GOLZOWENSE

SPORES AND POLLEN
- CYATHAEIDITES GIGANTIS
- CYATHIDITES SPP.
- GAMBIERINA EDWARSII
- GLEICHENIIDITES SPP.
- PHYLLOCLADIDITES MAWSONII
- PODOCARPIDITES SPP.
- PODOSPORITES ANTARCTICUS
- PODOSPORITES MICROSACCATUS
- PROTEACIDITES SP. CF. P. ANGULALTUS
- PROTEACIDITES SPP.
- TRICOLPITES GILLII

2561.4 METERS (SIDE-WALL CORE)

AGE : LATE MAASTRICHTIAN?
MA?

ENVIRONMENT : NONMARINE

FAUNA & FLORA : NEARLY BARREN

PRESERVATION : VERY POOR

SPECIES: OTHER
- BIODEGRADED TERRESTRIAL
- HERBACEOUS KEROGEN (CUTICLE)
- HERBACEOUS KEROGEN (SPORE-POLLEN)
- WOODY-COALY KEROGEN

SPORES AND POLLEN
- PROTEACIDITES SPP.
- TRICOLPITES SP. CF. T. LONGUS

2589.5 METERS (SIDE-WALL CORE)

FIGURE 6. BIOSTRATIGRAPHY OF MARLIN-4, TURRUM RESERVOIR

AGE : LATE MAASTRICHTIAN
MA

ENVIRONMENT : NONMARINE

FAUNA & FLORA : PYRITE SCARS

PRESERVATION : POOR-FAIR

SPECIES: OTHER
BIODEGRADED TERRESTRIAL
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
WOODY-COALY KEROGEN
SPORES AND POLLEN
CYATHAEIDITES GIGANTIS
CYATHIDITES SPP.
GAMBIERINA EDWARSII
GAMBIERINA RUDATA
GLEICHENIIDITES SPP.
LAEVIGATOSPORITES SPP.
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PODOSPORITES MICROSACCATUS
PROTEACIDITES ANGULALTUS
PROTEACIDITES SPP.
STEREISPORITES (TRIPUNCTISPORIS) SP.
STEREISPORITES ANTIQUASPORITES
STEREISPORITES REGIUM
TRICOLPITES CONFESSUS
TRICOLPITES GILLII
TRICOLPITES SP. CF. T. LONGUS
TRICOLPITES SPP.
TRICOLPORITES LILLIEI

APPENDIX F

Age Summary and Data

FIGURE 7. BIOSTRATIGRAPHY OF MARLIN-1, TURRUM RESERVOIR

A G E S U M M A R Y

(DEPTH IN METERS)

NO SAMPLES ABOVE A DEPTH OF 2014.6 METERS

2014.6	EARLY EOCENE SZ
2167.6	INDETERMINATE RB OR LOWER
2206.6	E. LATE PALEOCENE RC
2250-55	L. EARLY PALEOCENE RD1
2279.4	INDETERMINATE
2280-85	EARLY PALEOCENE RD2
2330-35	EARLY PALEOCENE? RE?
2370-75	EARLY PALEOCENE RE
2384.9	INDETERMINATE
2385-90	EARLY PALEOCENE RE
2395-2405	E. PALEOC.-?L. MAAST. RF
2555-60	PROB. L. MAASTRICHTIAN? RG?
2575.1	INDETERMINATE
2579.4	LATE MAASTRICHTIAN? MA?
2579.4	BOTTOM WELL SAMPLE EXAMINED

FIGURE 7. BIOSTRATIGRAPHY OF MARLIN-1, TURRUM RESERVOIR

E N V I R O N M E N T S U M M A R Y

(DEPTH IN METERS)

NO SAMPLES ABOVE A DEPTH OF 2014.6 METERS

2014.6	MARINE
2070.1	MARGINAL MARINE
2206.6	MARINE
2209.1	MARGINAL MARINE-MARINE
2214.3	MARINE
2230-35	MARGINAL MARINE-MARINE
2279.4	NONMARINE
2330-35	MARGINAL MARINE
2384.9	NONMARINE
2385-90	MARGINAL MARINE
2395-2405	NONMARINE
2555-60	NON-MARGINAL MARINE
2570-75	NONMARINE
2579.4	MARGINAL MARINE-MARINE
2579.4	BOTTOM WELL SAMPLE EXAMINED

FIGURE 7. BIOSTRATIGRAPHY OF MARLIN-1, TURRUM RESERVOIR

2014.6 METERS (SIDE-WALL CORE)

AGE : EARLY EOCENE
SZ

ENVIRONMENT : MARINE

PRESERVATION : FAIR-POOR

SPECIES: OTHER
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (SPORE-POLLEN)
WOODY-COALY KEROGEN
DINOFLAGELLATES
APECTODINIUM HOMOMORPHUM
APECTODINIUM SP. CF. A. HYPERACANTHUM
APECTODINIUM SPP.
APECTODINIUM SP. CF. A. SPP.
CYCLOPSIELLA SPP.
SENEGALINIUM DILWYNENSIS
UNDIFFERENTIATED FORMS
SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
BACULATISPORITES SPP.
DILWYNITES GRANULATUS
DILWYNITES TUBERCULATUS
GAMBIERINA RUDATA
GLEICHENIIDITES SPP.
LAEVIGATOSPORITES SPP.
LYGISTEPOLLENITES BALMEI
LYGISTEPOLLENITES FLORINII
MALVACILPOLLIS DIVERSUS
NOTHOFAGIDITES EMARCUDUS/HETERUS
NOTHOFAGIDITES ENDURUS
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PODOSPORITES MICROSACCATUS
PROTEACIDITES SP.
PROTEACIDITES SPP.
STEREISPORITES ANTIQUASPORITES

2070.1 METERS (SIDE-WALL CORE)

AGE : EARLY EOCENE
SZ

ENVIRONMENT : MARGINAL MARINE

FIGURE 7. BIOSTRATIGRAPHY OF MARLIN-1, TURRUM RESERVOIR

PRESERVATION : POOR

SPECIES: OTHER
BIODEGRADED TERRESTRIAL
BOTRYOCCUS SPP.
HERBACEOUS KEROGEN (SPORE-POLLEN)
WOODY-COALY KEROGEN
DINOFLAGELLATES
CYCLOPSIELLA SPP.
SENEGALINIUM DILWYNENSIS
SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
BACULATISPORITES SPP.
CLAVIFERA TRIPLEX
CYATHIDITES SPP.
DILWYNITES GRANULATUS
DILWYNITES TUBERCULATUS
ERICIPITES SPP.
GAMBIERINA RUDATA
GLEICHENIIDITES SPP.
HALORAGACIDITES HARRISII
HERKOSPORITES ELLIOTII
LAEVIGATOSPORITES SPP.
LATROBOSPORITES OHAIENSIS
LYGISTEPOLLENITES BALMEI
LYGISTEPOLLENITES FLORINII
NOTHOFAGIDITES BRACHYSPINULOSUS
NOTHOFAGIDITES EMARCUDUS/HETERUS
NOTHOFAGIDITES ENDURUS
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES MICROSACCATUS
PROTEACIDITES ANNULARIS
PROTEACIDITES MINUTUS
PROTEACIDITES SP.
PROTEACIDITES SPP.
STEREISPORITES (TRIPUNCTISPORIS) SP.
STEREISPORITES ANTIQUASPORITES
STEREISPORITES REGIUM
TRICOLPITES GILLII

2089.3 METERS (SIDE-WALL CORE)

AGE : EARLY EOCENE
SZ

ENVIRONMENT : MARGINAL MARINE

PRESERVATION : FAIR-POOR

FIGURE 7. BIOSTRATIGRAPHY OF MARLIN-1, TURRUM RESERVOIR

SPECIES: OTHER
- BIODEGRADED TERRESTRIAL
- BOTRYOCCUS SPP.
- DINOFLAGELLATES-ACRITARCHS
- HERBACEOUS KEROGEN (SPORE-POLLEN)
- WOODY-COALY KEROGEN

DINOFLAGELLATES
- APECTODINIUM SP. CF. A. SPP.
- CYCLOPSIELLA SPP.
- DEFLANDREA SPP.
- SENEGALINIUM DILWYNENSIS

SPORES AND POLLEN
- ARAUCARIACITES AUSTRALIS
- AUSTALOPOLLIS OBSCURUS
- BACULATISPORITES SPP.
- CLAVIFERA TRIPLEX
- CYATHAEIDITES GIGANTIS
- CYATHIDITES SPP.
- DILWYNITES GRANULATUS
- DILWYNITES TUBERCULATUS
- GAMBIERINA RUDATA
- GLEICHENIIDITES SPP.
- HALORAGACIDITES HARRISII
- HERKOSPORITES ELLIOTII
- LAEVIGATOSPORITES SPP.
- LATROBOSPORITES CRASSUS
- LYCOPODIUMSPORITES SPP.
- LYGISTEPOLLENITES BALMEI
- LYGISTEPOLLENITES FLORINII
- MALVACILPOLLIS SUBTILIS
- NOTHOFAGIDITES BRACHYSPINULOSUS
- NOTHOFAGIDITES EMARCUDUS/HETERUS
- NOTHOFAGIDITES ENDURUS
- PHYLLOCLADIDITES MAWSONII
- PODOCARPIDITES SPP.
- PODOSPORITES ANTARCTICUS
- PODOSPORITES MICROSACCATUS
- PROTEACIDITES MINUTUS
- PROTEACIDITES SP.
- PROTEACIDITES SPP.
- SCHIZOCOLPUS MARLINENSIS
- STEREISPORITES (TRIPUNCTISPORIS) SP.
- STEREISPORITES ANTIQUASPORITES
- TRICOLPITES SPP.
- TRICOLPORITES SPP.

2167.6 METERS (SIDE-WALL CORE)

AGE :
- INDETERMINATE
- RB OR LOWER

FIGURE 7. BIOSTRATIGRAPHY OF MARLIN-1, TURRUM RESERVOIR

ENVIRONMENT : MARGINAL MARINE

PRESERVATION : POOR

SPECIES: OTHER
BOTRYOCCUS SPP.
DINOFLAGELLATES
APECTODINIUM SP. CF. A. SPP.
CYCLOPSIELLA SPP.
SENEGALINIUM DILWYNENSIS
UNDIFFERENTIATED FORMS
SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
BACULATISPORITES SPP.
CLAVIFERA TRIPLEX
CYATHIDITES SPP.
DILWYNITES GRANULATUS
DILWYNITES TUBERCULATUS
GAMBIERINA RUDATA
GLEICHENIIDITES SPP.
LAEVIGATOSPORITES SPP.
LATROBOSPORITES CRASSUS
LATROBOSPORITES OHAIENSIS
LYGISTEPOLLENITES BALMEI
LYGISTEPOLLENITES FLORINII
NOTHOFAGIDITES BRACHYSPINULOSUS
NOTHOFAGIDITES EMARCUDUS/HETERUS
NOTHOFAGIDITES ENDURUS
PEROMONOLETES DENSUS
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PROTEACIDITES ANGULALTUS
PROTEACIDITES SP.
PROTEACIDITES SPP.
STEREISPORITES (TRIPUNCTISPORIS) SP.
STEREISPORITES ANTIQUASPORITES
TRICOLPITES SPP.
VERRUCOSISPORITES SPP.

2206.6 METERS (CONVENTIONAL CORE)

AGE : E. LATE PALEOCENE
RC

ENVIRONMENT : MARINE

PRESERVATION : FAIR-POOR

SPECIES: OTHER
BIODEGRADED TERRESTRIAL

FIGURE 7. BIOSTRATIGRAPHY OF MARLIN-1, TURRUM RESERVOIR

DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (SPORE-POLLEN)
WOODY-COALY KEROGEN

DINOFLAGELLATES
APECTODINIUM SP. CF. A. SPP.
CERODINIUM SP. CF. C. SPECIOSUM
CYCLOPSIELLA SPP.
DEFLANDREA SPP.
GLAPHYROCYSTA RETIINTEXTA
GLAPHYROCYSTA SPP.
HYSTRICHOSPHAERIDIUM SP.
OPERCULODINIUM CENTROCARPUM
PALAEOCYSTODINIUM AUSTRALINUM
PALAEOCYSTODINIUM GOLZOWENSE
PALAEOCYSTODINIUM SP.
PARALECANIELLA INDENTATA
SENEGALINIUM DILWYNENSIS
SPINIDINIUM SP. CF. S. DENSISPINATUM
SPINIDINIUM SP. AFF. S. MACMURDOENSE
SPINIDINIUM SPP.
SPINIFERITES SPP.
UNDIFFERENTIATED FORMS
VOZZHENNIKOVIA SPP.

SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
CLAVIFERA TRIPLEX
CYATHAEIDITES GIGANTIS
CYATHIDITES SPP.
DILWYNITES GRANULATUS
GAMBIERINA RUDATA
GLEICHENIIDITES SPP.
LAEVIGATOSPORITES SPP.
LATROBOSPORITES OHAIENSIS
LYCOPODIUMSPORITES SPP.
LYGISTEPOLLENITES BALMEI
LYGISTEPOLLENITES FLORINII
NOTHOFAGIDITES BRACHYSPINULOSUS
NOTHOFAGIDITES EMARCUDUS/HETERUS
NOTHOFAGIDITES ENDURUS
PERIPOROPOLLENITES POLYPORATUS
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PODOSPORITES MICROSACCATUS
PROTEACIDITES ANGULALTUS
PROTEACIDITES MINUTUS
PROTEACIDITES SP.
PROTEACIDITES SPP.
STEREISPORITES (TRIPUNCTISPORIS) SP.
STEREISPORITES ANTIQUASPORITES
TRICOLPITES SPP.

FIGURE 7. BIOSTRATIGRAPHY OF MARLIN-1, TURRUM RESERVOIR

2209.1 METERS (CONVENTIONAL CORE)

AGE : E. LATE PALEOCENE
RC

ENVIRONMENT : MARGINAL MARINE-MARINE

PRESERVATION : FAIR-POOR

SPECIES: OTHER
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (CUTICLE)
WOODY-COALY KEROGEN
DINOFLAGELLATES
GLAPHYROCYSTA RETIINTEXTA
HAFNIASPHAERA SP.
ISABELIDINIUM BAKERI
PALAEOCYSTODINIUM GOLZOWENSE
SENEGALINIUM DILWYNENSIS
SPINIDINIUM SPP.
SPINIFERITES SPP.
SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
CYATHIDITES SPP.
GLEICHENIIDITES SPP.
LAEVIGATOSPORITES SPP.
LYGISTEPOLLENITES BALMEI
LYGISTEPOLLENITES FLORINII
NOTHOFAGIDITES EMARCUDUS/HETERUS
NOTHOFAGIDITES ENDURUS
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PODOSPORITES MICROSACCATUS
PROTEACIDITES ANGULALTUS
PROTEACIDITES SPP.
STEREISPORITES ANTIQUASPORITES
TRICOLPITES SPP.

2214.3 METERS (CONVENTIONAL CORE)

AGE : E. LATE PALEOCENE
RC

ENVIRONMENT : MARINE

PRESERVATION : FAIR-POOR

SPECIES: DINOFLAGELLATES
CERODINIUM SP. CF. C. SPECIOSUM

FIGURE 7. BIOSTRATIGRAPHY OF MARLIN-1, TURRUM RESERVOIR

CYCLOPSIELLA SPP.
DEFLANDREA SPP.
DIPHYES COLLIGERUM
EISENACKIA CRASSITABULATA
GLAPHYROCYSTA RETIINTEXTA
HAFNIASPHAERA SP.
ISABELIDINIUM BAKERI
OPERCULODINIUM CENTROCARPUM
PALAEOCYSTODINIUM GOLZOWENSE
PALAEOCYSTODINIUM SP.
SENEGALINIUM DILWYNENSIS
SPINIFERITES SPP.
UNDIFFERENTIATED FORMS

SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
GLEICHENIIDITES SPP.
HERKOSPORITES ELLIOTII
LYGISTEPOLLENITES BALMEI
NOTHOFAGIDITES EMARCUDUS/HETERUS
NOTHOFAGIDITES ENDURUS
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PODOSPORITES MICROSACCATUS
PROTEACIDITES SPP.
STEREISPORITES ANTIQUASPORITES
TRICOLPITES SPP.

2230-35 METERS (DITCH SAMPLE)

AGE : E. LATE PALEOCENE
RC

ENVIRONMENT : MARGINAL MARINE-MARINE

FAUNA & FLORA : DK KEROGEN

PRESERVATION : FAIR-POOR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (CUTICLE)
WOODY-COALY KEROGEN

DINOFLAGELLATES
APECTODINIUM SP. CF. A. SPP.
CERODINIUM SP. CF. C. SPECIOSUM
GLAPHYROCYSTA RETIINTEXTA
GLAPHYROCYSTA SPP.

FIGURE 7. BIOSTRATIGRAPHY OF MARLIN-1, TURRUM RESERVOIR

ISABELIDINIUM SPP.
PALAEOCYSTODINIUM SP. CF. P. AUSTRALINUM
PALAEOCYSTODINIUM GOLZOWENSE
SENEGALINIUM DILWYNENSIS
SPINIFERITES SPP.
UNDIFFERENTIATED FORMS

SPORES AND POLLEN

AUSTALOPOLLIS OBSCURUS
CYATHIDITES SPP.
GAMBIERINA EDWARSII
GLEICHENIIDITES SPP.
LAEVIGATOSPORITES SPP.
LATROBOSPORITES CRASSUS
LATROBOSPORITES OHAIENSIS
LYGISTEPOLLENITES BALMEI
NOTHOFAGIDITES ENDURUS
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PODOSPORITES MICROSACCATUS
PROTEACIDITES SPP.
STEREISPORITES ANTIQUASPORITES
TRICOLPITES GILLII
TRICOLPITES SPP.

2250-55 METERS (DITCH SAMPLE)

AGE : L. EARLY PALEOCENE
RD1

ENVIRONMENT : MARGINAL MARINE-MARINE

FAUNA & FLORA : DK KEROGEN

PRESERVATION : FAIR-POOR

SPECIES: OTHER

AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (CUTICLE)
WOODY-COALY KEROGEN

DINOFLAGELLATES

APECTODINIUM SP. CF. A. SPP.
CERODINIUM SP. CF. C. SPECIOSUM
EISENACKIA CRASSITABULATA
GLAPHYROCYSTA RETIINTEXTA
PALAEOCYSTODINIUM GOLZOWENSE
SENEGALINIUM DILWYNENSIS
SPINIDINIUM SP. CF. S. DENSISPINATUM

FIGURE 7. BIOSTRATIGRAPHY OF MARLIN-1, TURRUM RESERVOIR

SPINIDINIUM SPP.
VOZZHENNIKOVIA ANGULATA
VOZZHENNIKOVIA APERTURA
VOZZHENNIKOVIA SPP.
SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
CYATHIDITES SPP.
GLEICHENIIDITES SPP.
LAEVIGATOSPORITES SPP.
LYGISTEPOLLENITES BALMEI
NOTHOFAGIDITES ENDURUS
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PODOSPORITES MICROSACCATUS
PROTEACIDITES ANGULALTUS
PROTEACIDITES SPP.
STEREISPORITES ANTIQUASPORITES
TRICOLPITES SPP.

2279.4 METERS (CONVENTIONAL CORE)

AGE : INDETERMINATE

ENVIRONMENT : NONMARINE

FAUNA & FLORA : NEARLY BARREN

PRESERVATION : POOR

SPECIES: OTHER
BIODEGRADED TERRESTRIAL
WOODY-COALY KEROGEN
SPORES AND POLLEN
PODOCARPIDITES SPP.

2280-85 METERS (DITCH SAMPLE)

AGE : EARLY PALEOCENE
RD2

ENVIRONMENT : NONMARINE

PRESERVATION : FAIR

SPECIES: OTHER
AMORPHOUS KEROGEN

FIGURE 7. BIOSTRATIGRAPHY OF MARLIN-1, TURRUM RESERVOIR

BIODEGRADED TERRESTRIAL
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
WOODY-COALY KEROGEN

SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
BACULATISPORITES SPP.
CYATHIDITES SPP.
GAMBIERINA RUDATA
GLEICHENIIDITES SPP.
HERKOSPORITES ELLIOTII
LAEVIGATOSPORITES SPP.
LYGISTEPOLLENITES BALMEI
NOTHOFAGIDITES ENDURUS
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PODOSPORITES MICROSACCATUS
PROTEACIDITES ANGULALTUS
PROTEACIDITES SPP.
STEREISPORITES (TRIPUNCTISPORIS) SP.
STEREISPORITES ANTIQUASPORITES
TRICOLPITES PHILLIPSII
TRICOLPITES SPP.

2283.1 METERS (CONVENTIONAL CORE)

AGE : EARLY PALEOCENE
RD2

ENVIRONMENT : NONMARINE

PRESERVATION : POOR

SPECIES: OTHER
BIODEGRADED TERRESTRIAL
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
PEDIASTRUM SP. CF. P. SPP.
WOODY-COALY KEROGEN

DINOFLAGELLATES
DEFLANDREA SPP.

SPORES AND POLLEN
CYATHIDITES SPP.
GAMBIERINA SP. CF. G. EDWARSII
GLEICHENIIDITES SPP.
HALORAGACIDITES HARRISII
HERKOSPORITES ELLIOTII
ISCHYOSPORITES IRREGULARIS
LAEVIGATOSPORITES SPP.

FIGURE 7. BIOSTRATIGRAPHY OF MARLIN-1, TURRUM RESERVOIR

LYGISTEPOLLENITES BALMEI
LYGISTEPOLLENITES FLORINII
PODOCARPIDITES SPP.
PROTEACIDITES ANGULALTUS
PROTEACIDITES SP.
PROTEACIDITES SPP.
STEREISPORITES (TRIPUNCTISPORIS) SP.
STEREISPORITES ANTIQUASPORITES
STEREISPORITES REGIUM

2287.7 METERS (CONVENTIONAL CORE)

AGE : EARLY PALEOCENE
RD2

ENVIRONMENT : NONMARINE

FAUNA & FLORA : COAL

PRESERVATION : POOR

SPECIES: OTHER
AMORPHOUS KEROGEN
HERBACEOUS KEROGEN (SPORE-POLLEN)
WOODY-COALY KEROGEN
SPORES AND POLLEN
CLAVIFERA TRIPLEX
CYATHIDITES SPP.
DILWYNITES GRANULATUS
GLEICHENIIDITES SPP.
LAEVIGATOSPORITES SPP.
LATROBOSPORITES CRASSUS
NOTHOFAGIDITES BRACHYSPINULOSUS
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PODOSPORITES MICROSACCATUS
PROTEACIDITES ANGULALTUS
PROTEACIDITES SPP.
STEREISPORITES (TRIPUNCTISPORIS) SP.
STEREISPORITES ANTIQUASPORITES
STEREISPORITES REGIUM
TRICOLPITES GILLII
TRICOLPITES SPP.

2290-95 METERS (DITCH SAMPLE)

FIGURE 7. BIOSTRATIGRAPHY OF MARLIN-1, TURRUM RESERVOIR

AGE : EARLY PALEOCENE
RD2

ENVIRONMENT : NONMARINE

PRESERVATION : FAIR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
WOODY-COALY KEROGEN
DINOFLAGELLATES
VOZZHENNIKOVIA SPP.
SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
CYATHIDITES SPP.
GLEICHENIIDITES SPP.
HERKOSPORITES ELLIOTII
LAEVIGATOSPORITES SPP.
LYGISTEPOLLENITES BALMEI
NOTHOFAGIDITES ENDURUS
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PODOSPORITES MICROSACCATUS
PROTEACIDITES ANGULALTUS
PROTEACIDITES SPP.
STEREISPORITES (TRIPUNCTISPORIS) SP.
STEREISPORITES ANTIQUASPORITES
TRICOLPITES GILLII
TRICOLPITES SPP.

2313.9 METERS (SIDE-WALL CORE)

AGE : EARLY PALEOCENE
RD2

ENVIRONMENT : NONMARINE

PRESERVATION : POOR

SPECIES: OTHER
AMORPHOUS KEROGEN
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
WOODY-COALY KEROGEN
SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS

FIGURE 7. BIOSTRATIGRAPHY OF MARLIN-1, TURRUM RESERVOIR

CYATHIDITES SPP.
GLEICHENIIDITES SPP.
HERKOSPORITES ELLIOTII
LAEVIGATOSPORITES SPP.
LYGISTEPOLLENITES BALMEI
MONOCOLPITES SPP.
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PROTEACIDITES ANGULALTUS
PROTEACIDITES SP.
PROTEACIDITES SPP.
STEREISPORITES (TRIPUNCTISPORIS) SP.
STEREISPORITES ANTIQUASPORITES
TETRACOLPORITES VERRUCOSUS
TRICOLPITES GILLII
TRICOLPITES SPP.

2320-25 METERS (DITCH SAMPLE)

AGE : EARLY PALEOCENE
RD2

ENVIRONMENT : NONMARINE

PRESERVATION : FAIR-POOR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (CUTICLE)
WOODY-COALY KEROGEN
DINOFLAGELLATES
APECTODINIUM SP. CF. A. SPP.
SENEGALINIUM DILWYNENSIS
VOZZHENNIKOVIA SPP.
SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
BACULATISPORITES SPP.
CYATHIDITES SPP.
GLEICHENIIDITES SPP.
LAEVIGATOSPORITES SPP.
LATROBOSPORITES CRASSUS
LYGISTEPOLLENITES BALMEI
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PODOSPORITES MICROSACCATUS
PROTEACIDITES ANGULALTUS

FIGURE 7. BIOSTRATIGRAPHY OF MARLIN-1, TURRUM RESERVOIR

PROTEACIDITES SPP.
STEREISPORITES ANTIQUASPORITES
TETRACOLPORITES VERRUCOSUS
TRICOLPITES GILLII
TRICOLPITES SPP.

2330-35 METERS (DITCH SAMPLE)

AGE : EARLY PALEOCENE?
RE?

ENVIRONMENT : MARGINAL MARINE

PRESERVATION : FAIR-POOR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (CUTICLE)
WOODY-COALY KEROGEN
DINOFLAGELLATES
APECTODINIUM SP. CF. A. SPP.
CERODINIUM SP. CF. C. SPP.
PALAEOCYSTODINIUM SPP.
SENEGALINIUM DILWYNENSIS
SPINIDINIUM SP. CF. S. DENSISPINATUM
SPINIDINIUM SPP.
VOZZHENNIKOVIA APERTURA
SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
BACULATISPORITES SPP.
CYATHIDITES SPP.
GAMBIERINA RUDATA
GLEICHENIIDITES SPP.
LAEVIGATOSPORITES SPP.
LYGISTEPOLLENITES BALMEI
LYGISTEPOLLENITES FLORINII
PEROMONOLETES DENSUS
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PODOSPORITES MICROSACCATUS
PROTEACIDITES ANGULALTUS
PROTEACIDITES SPP.
STEREISPORITES (TRIPUNCTISPORIS) SP.
STEREISPORITES ANTIQUASPORITES
TRICOLPITES GILLII
TRICOLPITES SPP.

FIGURE 7. BIOSTRATIGRAPHY OF MARLIN-1, TURRUM RESERVOIR

2350-55 METERS (DITCH SAMPLE)

AGE : EARLY PALEOCENE?
RE?

ENVIRONMENT : MARGINAL MARINE

PRESERVATION : FAIR-POOR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (CUTICLE)
WOODY-COALY KEROGEN

DINOFLAGELLATES
APECTODINIUM SP. CF. A. SPP.
CERODINIUM SP. CF. C. SPP.
GLAPHYROCYSTA PASTIELSII
GLAPHYROCYSTA RETIINTEXTA
SPINIDINIUM SP. CF. S. DENSISPINATUM
SPINIDINIUM SPP.
VOZZHENNIKOVIA ANGULATA
VOZZHENNIKOVIA SPP.

SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
BACULATISPORITES SPP.
CYATHIDITES SPP.
GAMBIERINA RUDATA
GLEICHENIIDITES SPP.
LAEVIGATOSPORITES SPP.
LYGISTEPOLLENITES BALMEI
LYGISTEPOLLENITES FLORINII
PEROMONOLETES DENSUS
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PODOSPORITES MICROSACCATUS
PROTEACIDITES ANGULALTUS
PROTEACIDITES SPP.
STEREISPORITES ANTIQUASPORITES
STEREISPORITES REGIUM
TRICOLPITES PHILLIPSII
TRICOLPITES SPP.

2370-75 METERS (DITCH SAMPLE)

AGE : EARLY PALEOCENE
RE

FIGURE 7. BIOSTRATIGRAPHY OF MARLIN-1, TURRUM RESERVOIR

ENVIRONMENT : MARGINAL MARINE

PRESERVATION : FAIR-POOR

SPECIES: OTHER
- AMORPHOUS KEROGEN
- BIODEGRADED TERRESTRIAL
- DINOFLAGELLATES-ACRITARCHS
- HERBACEOUS KEROGEN (CUTICLE)
- WOODY-COALY KEROGEN

DINOFLAGELLATES
- ALISOCYSTA SP. CF. A. MARGARITA
- CERODINIUM SP. CF. C. DARTMOORIA (SENSU WILSON, 1
- CERODINIUM SP. CF. C. SPECIOSUM
- SENEGALINIUM DILWYNENSIS
- SPINIDINIUM SP. CF. S. DENSISPINATUM
- SPINIDINIUM SPP.
- VOZZHENNIKOVIA APERTURA

SPORES AND POLLEN
- AUSTALOPOLLIS OBSCURUS
- BACULATISPORITES SPP.
- CYATHIDITES SPP.
- DILWYNITES GRANULATUS
- GLEICHENIIDITES SPP.
- LAEVIGATOSPORITES SPP.
- LYGISTEPOLLENITES BALMEI
- LYGISTEPOLLENITES FLORINII
- PHYLLOCLADIDITES MAWSONII
- PODOCARPIDITES SPP.
- PODOSPORITES MICROSACCATUS
- PROTEACIDITES ANGULALTUS
- PROTEACIDITES SPP.
- STEREISPORITES ANTIQUASPORITES
- TRICOLPITES GILLII
- TRICOLPITES SPP.

2384.9 METERS (SIDE-WALL CORE)

AGE : INDETERMINATE

ENVIRONMENT : NONMARINE

FAUNA & FLORA : MUD CONTAM.

PRESERVATION : POOR-FAIR

SPECIES: OTHER
- AMORPHOUS KEROGEN
- BOTRYOCCUS SPP.
- HERBACEOUS KEROGEN (CUTICLE)

FIGURE 7. BIOSTRATIGRAPHY OF MARLIN-1, TURRUM RESERVOIR

HERBACEOUS KEROGEN (SPORE-POLLEN)
WOODY-COALY KEROGEN

DINOFLAGELLATES
APECTODINIUM SP. CF. A. SPP.
GLAPHYROCYSTA RETIINTEXTA

SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
BACULATISPORITES SPP.
DILWYNITES GRANULATUS
EPHEDRIPITES NOTENSIS
ERICIPITES SPP.
GLEICHENIIDITES SPP.
HALORAGACIDITES HARRISII
HERKOSPORITES ELLIOTII
LAEVIGATOSPORITES SPP.
LYCOPODIUMSPORITES SPP.
LYGISTEPOLLENITES BALMEI
LYGISTEPOLLENITES FLORINII
NOTHOFAGIDITES BRACHYSPINULOSUS
PERIPOROPOLLENITES POLYPORATUS
PEROHONOLETES DENSUS
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PODOSPORITES MICROSACCATUS
PROTEACIDITES ANGULALTUS
PROTEACIDITES SP.
PROTEACIDITES SPP.
STEREISPORITES ANTIQUASPORITES
TETRACOLPORITES VERRUCOSUS
TRICOLPITES GILLII
TRICOLPITES PHILLIPSII
TRICOLPITES SPP.
TRICOLPORITES SPP.

2385-90 METERS (DITCH SAMPLE)

AGE : EARLY PALEOCENE
RE

ENVIRONMENT : MARGINAL MARINE

PRESERVATION : FAIR-POOR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (CUTICLE)
WOODY-COALY KEROGEN

FIGURE 7. BIOSTRATIGRAPHY OF MARLIN-1, TURRUM RESERVOIR

DINOFLAGELLATES
- CERODINIUM SP. CF. C. SPECIOSUM
- ISABELIDINIUM SP. CF. I. BAKERI
- SPINIDINIUM SP. CF. S. DENSISPINATUM
- SPINIDINIUM SPP.
- VOZZHENNIKOVIA ANGULATA

SPORES AND POLLEN
- AUSTALOPOLLIS OBSCURUS
- CYATHIDITES SPP.
- GLEICHENIIDITES SPP.
- HERKOSPORITES ELLIOTII
- LAEVIGATOSPORITES SPP.
- LYGISTEPOLLENITES BALMEI
- LYGISTEPOLLENITES FLORINII
- PHYLLOCLADIDITES MAWSONII
- PODOCARPIDITES SPP.
- PODOSPORITES ANTARCTICUS
- PODOSPORITES MICROSACCATUS
- PROTEACIDITES ANGULALTUS
- PROTEACIDITES SPP.
- STEREISPORITES ANTIQUASPORITES
- TETRACOLPORITES VERRUCOSUS
- TRICOLPITES SPP.
- TRICOLPORITES SPP.

2395-2405 METERS (DITCH SAMPLE)

AGE : E. PALEOC.-?L. MAAST.
RF

ENVIRONMENT : NONMARINE

PRESERVATION : FAIR-POOR

SPECIES: OTHER
- AMORPHOUS KEROGEN
- BIODEGRADED TERRESTRIAL
- HERBACEOUS KEROGEN (CUTICLE)
- HERBACEOUS KEROGEN (SPORE-POLLEN)
- WOODY-COALY KEROGEN

DINOFLAGELLATES
- APECTODINIUM SP. CF. A. SPP.
- SPINIDINIUM SP. CF. S. DENSISPINATUM
- VOZZHENNIKOVIA SPP.

SPORES AND POLLEN
- AUSTALOPOLLIS OBSCURUS
- BACULATISPORITES SPP.
- CICATRICOSISPORITES SPP.
- CYATHIDITES SPP.
- GAMBIERINA RUDATA

FIGURE 7. BIOSTRATIGRAPHY OF MARLIN-1, TURRUM RESERVOIR

GLEICHENIIDITES SPP.
LAEVIGATOSPORITES SPP.
LYGISTEPOLLENITES SP. CF. L. BALMEI
LYGISTEPOLLENITES FLORINII
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PODOSPORITES MICROSACCATUS
PROTEACIDITES ANGULALTUS
PROTEACIDITES SPP.
STEREISPORITES (TRIPUNCTISPORIS) SP.
STEREISPORITES ANTIQUASPORITES
TRICOLPITES SP. CF. T. CONFESSUS
TRICOLPITES PHILLIPSII
TRICOLPITES SPP.

2425-30 METERS (DITCH SAMPLE)

AGE : E. PALEOC.-?L. MAAST.
RF

ENVIRONMENT : NONMARINE

PRESERVATION : FAIR-POOR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (CUTICLE)
WOODY-COALY KEROGEN
DINOFLAGELLATES
APECTODINIUM SP. CF. A. SPP.
DEFLANDREA SP.
ISABELIDINIUM BAKERI
SENEGALINIUM DILWYNENSIS
SPINIDINIUM SP. CF. S. DENSISPINATUM
SPINIDINIUM SPP.
SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
CYATHIDITES SPP.
GLEICHENIIDITES SPP.
LAEVIGATOSPORITES SPP.
LYGISTEPOLLENITES SP. CF. L. BALMEI
NOTHOFAGIDITES SPP.
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES MICROSACCATUS
PROTEACIDITES ANGULALTUS
PROTEACIDITES SPP.

FIGURE 7. BIOSTRATIGRAPHY OF MARLIN-1, TURRUM RESERVOIR

STEREISPORITES ANTIQUASPORITES
TRICOLPITES SP. CF. T. CONFESSUS
TRICOLPITES GILLII
TRICOLPITES SPP.

2555-60 METERS (DITCH SAMPLE)

AGE : PROB. L. MAASTRICHTIAN?
RG?

ENVIRONMENT : NON-MARGINAL MARINE

FAUNA & FLORA : DK KEROGEN

PRESERVATION : POOR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (CUTICLE)
WOODY-COALY KEROGEN
DINOFLAGELLATES
APECTODINIUM SP. CF. A. SPP.
DEFLANDREA SPP.
MANUMIELLA SP. CF. M. DRUGGII
UNDIFFERENTIATED FORMS
SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
BACULATISPORITES SPP.
CYATHIDITES SPP.
GAMBIERINA EDWARSII
GLEICHENIIDITES SPP.
HERKOSPORITES ELLIOTII
LAEVIGATOSPORITES SPP.
LYGISTEPOLLENITES SP. CF. L. BALMEI
LYGISTEPOLLENITES FLORINII
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PODOSPORITES MICROSACCATUS
PROTEACIDITES ANGULALTUS
PROTEACIDITES SPP.
STEREISPORITES ANTIQUASPORITES
TETRACOLPORITES VERRUCOSUS
TRICOLPITES SP. CF. T. CONFESSUS
TRICOLPITES GILLII
TRICOLPITES SPP.

FIGURE 7. BIOSTRATIGRAPHY OF MARLIN-1, TURRUM RESERVOIR

2570-75 METERS (DITCH SAMPLE)

AGE : PROB. L. MAASTRICHTIAN?
RG?

ENVIRONMENT : NONMARINE

FAUNA & FLORA : DK KEROGEN

PRESERVATION : POOR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
WOODY-COALY KEROGEN
SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
BACULATISPORITES SPP.
CYATHIDITES SPP.
EPHEDRIPITES SPP.
GAMBIERINA EDWARSII
GLEICHENIIDITES SPP.
HERKOSPORITES ELLIOTII
LAEVIGATOSPORITES SPP.
LYGISTEPOLLENITES SP. CF. L. BALMEI
LYGISTEPOLLENITES FLORINII
PEROTRILELTES SP.
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PODOSPORITES MICROSACCATUS
PROTEACIDITES ANGULALTUS
PROTEACIDITES SPP.
TETRACOLPORITES VERRUCOSUS
TRICOLPITES CONFESSUS
TRICOLPITES GILLII
TRICOLPITES PHILLIPSII
TRICOLPITES SPP.
TRILETE SPORES, ORNAM. (UNDIFF.)
TRILETE SPORES, SMOOTH (UNDIFF.)

2575.1 METERS (SIDE-WALL CORE)

AGE : INDETERMINATE

ENVIRONMENT : NONMARINE

PRESERVATION : VERY POOR

FIGURE 7. BIOSTRATIGRAPHY OF MARLIN-1, TURRUM RESERVOIR

SPECIES: OTHER
WOODY-COALY KEROGEN
SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
CYATHAEIDITES GIGANTIS
CYATHIDITES SPP.
GLEICHENIIDITES SPP.
ISCHYOSPORITES IRREGULARIS
LATROBOSPORITES OHAIENSIS
LYGISTEPOLLENITES BALMEI
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PROTEACIDITES SP. CF. P. AMOLOSEXINUS
PROTEACIDITES SPP.

2579.4 METERS (CONVENTIONAL CORE)

AGE : LATE MAASTRICHTIAN?
MA?

ENVIRONMENT : MARGINAL MARINE-MARINE

PRESERVATION : POOR

SPECIES: OTHER
BIODEGRADED TERRESTRIAL
HERBACEOUS KEROGEN (SPORE-POLLEN)
WOODY-COALY KEROGEN
DINOFLAGELLATES
CORDOSPHAERIDIUM SP. CF. C. SPP.
DEFLANDREA SPP.
GLAPHYROCYSTA SPP.
MANUMIELLA SP. AFF. M. DRUGGII
OLIGOSPHAERIDIUM COMPLEX
PALAEOCYSTODINIUM GOLZOWENSE
PARALECANIELLA INDENTATA
SPINIFERITES SPP.
SYSTEMATOPHORA SPP.
TURBIOSPHAERA SP. CF. T. FILOSA
UNDIFFERENTIATED FORMS
SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
BACULATISPORITES SPP.
CICATRICOSISPORITES SPP.
CYATHIDITES SPP.
DILWYNITES GRANULATUS
GAMBIERINA EDWARSII
GLEICHENIIDITES SPP.
HERKOSPORITES ELLIOTII

FIGURE 7. BIOSTRATIGRAPHY OF MARLIN-1, TURRUM RESERVOIR

LYGISTEPOLLENITES BALMEI
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PROTEACIDITES ANGULALTUS
PROTEACIDITES SP.
PROTEACIDITES SPP.
STEREISPORITES (TRIPUNCTISPORIS) SP.
STEREISPORITES ANTIQUASPORITES
TRICOLPITES GILLII
TRICOLPITES SPP.

APPENDIX G

Age Summary and Data

FIGURE 8. BIOSTRATIGRAPHY OF TURRUM-1, TURRUM RESERVOIR

A G E S U M M A R Y

(DEPTH IN METERS)

NO SAMPLES ABOVE A DEPTH OF 1953.4 METERS

1953.4	PROB MIDDLE EOCENE N. ASPERUS
1955-55.2	PROB MIDDLE EOCENE N. ASPEREUS
1959.8	PROB MIDDLE EOCENE N. ASPERUS
2054-57	MIDDLE-EARLY EOCENE? MIXED ASSEMBLAGE
2085-88	E. LATE PALEOCENE RC
2103.0	INDETERMINATE
2109-12	E. LATE PALEOCENE RC
2151.8	L. EARLY PALEOCENE? RD1?
2168.9	L. EARLY PALEOCENE RD1
2184.1	INDETERMINATE
2234-37	EARLY PALEOCENE RD2
2270.6	INDETERMINATE
2295-98	E. PALEOC.-?L. MAAST.? RF?
2365-68	E. PALEOC.-?L. MAAST. RF
2387-90	INDETERMINATE
2405-8	INDETERMINATE RG?
2481.6	LATE MAASTRICHTIAN

FIGURE 8. BIOSTRATIGRAPHY OF TURRUM-1, TURRUM RESERVOIR

A G E S U M M A R Y - C O N T I N U E D

(DEPTH IN METERS)

	MA
2481.6	BOTTOM WELL SAMPLE EXAMINED

FIGURE 8. BIOSTRATIGRAPHY OF TURRUM-1, TURRUM RESERVOIR

E N V I R O N M E N T S U M M A R Y

(DEPTH IN METERS)

NO SAMPLES ABOVE A DEPTH OF 1953.4 METERS

1953.4	MARINE
2036.0	MARGINAL MARINE
2054-57	MARGINAL-NONMARINE
2085-88	MARGINAL MARINE
2151.8	NONMARINE
2158.9	MARGINAL MARINE
2168.9	MARINE
2184.1	NONMARINE
2234-37	NON-MARGINAL MARINE
2252-59	MARGINAL MARINE-MARINE
2270.6	NONMARINE
2405-8	MARGINAL?-NONMARINE
2426-35	NONMARINE
2438.3	MARGINAL-NONMARINE
2438-43	NONMARINE
2481.6	BOTTOM WELL SAMPLE EXAMINED

FIGURE 8. BIOSTRATIGRAPHY OF TURRUM-1, TURRUM RESERVOIR

1953.4 METERS (CONVENTIONAL CORE)

AGE : PROB MIDDLE EOCENE
N. ASPERUS

ENVIRONMENT : MARINE

FAUNA & FLORA : DINOS TORN

PRESERVATION : POOR

SPECIES: OTHER
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
WOODY-COALY KEROGEN
DINOFLAGELLATES
AREOSPHAERIDIUM SP. CF. A. FENESTRATUM
CORDOSPHAERIDIUM SPP.
DEFLANDREA HETEROPHLYCTA
DEFLANDREA SPP.
DINOFLAGELLATE 3
DINOFLAGELLATE 4
OLIGOSPHAERIDIUM COMPLEX
OPERCULODINIUM CENTROCARPUM
PALAEOSTOMOCYSTIS SP.
SPINIFERITES SPP.
UNDIFFERENTIATED FORMS
SPORES AND POLLEN
CUPANIEIDITES ORTHOTEICHUS
CYATHIDITES SPP.
GLEICHENIIDITES SPP.
HALORAGACIDITES HARRISII
LYGISTEPOLLENITES FLORINII
MALVACILPOLLIS SUBTILIS
NOTHOFAGIDITES DEMINUTUS
NOTHOFAGIDITES FALCATUS
NOTHOFAGIDITES FLEMINGII
PODOCARPIDITES SPP.
PROTEACIDITES ANNULARIS
PROTEACIDITES PACHYPOLUS
PROTEACIDITES SPP.
PROTEACIDITES STIPPLATUS

1955-55.2 METERS (CONVENTIONAL CORE)

AGE : PROB MIDDLE EOCENE
N. ASPEREUS

ENVIRONMENT : MARINE

FIGURE 8. BIOSTRATIGRAPHY OF TURRUM-1, TURRUM RESERVOIR

FAUNA & FLORA : DINOS BROKEN

PRESERVATION : FAIR-POOR

SPECIES: OTHER
- DINOFLAGELLATES-ACRITARCHS
- HERBACEOUS KEROGEN (SPORE-POLLEN)
- WOODY-COALY KEROGEN

DINOFLAGELLATES
- APECTODINIUM SP. CF. A. HOMOMORPHUM
- AREOSPHAERIDIUM SP. CF. A. ARCUATUM
- AREOSPHAERIDIUM FENESTRATUM
- AREOSPHAERIDIUM MULTICORNUTUM
- CORDOSPHAERIDIUM FIBROSPINOSUM
- CORDOSPHAERIDIUM SPP.
- DEFLANDREA HETEROPHLYCTA
- DEFLANDREA OEBISFELDENSIS
- DEFLANDREA SPP.
- DEFLANDREA SP. CF. D. TRUNCATA
- DINOFLAGELLATE 2
- DINOFLAGELLATE 3
- HOMOTRYBLIUM TENUISPINOSUM
- HOROLOGINELLA INCURVATA
- HYSTRICHOKOLPOMA RIGAUDIAE
- HYSTRICHOKOLPOMA SP.
- HYSTRICHOKOLPOMA UNISPINUM
- KALLOSPHAERIDIUM SP. CF. K. BREVIBARBATUM
- KISSELOVIA SP. CF. K. COLEOTHRYPTA
- MELITASPHAERIDIUM SP. CF. M. PSEUDORECURVATUM
- OLIGOSPHAERIDIUM COMPLEX
- OPERCULODINIUM CENTROCARPUM
- RHOMBODINIUM DRACO
- SPINIDINIUM SP.

SPORES AND POLLEN
- BANKSIEAEIDITES ARCUATUS
- CLAVIFERA TRIPLEX
- CUPANIEIDITES ORTHOTEICHUS
- ERICIPITES SPP.
- GLEICHENIIDITES SPP.
- HALORAGACIDITES HARRISII
- LILIACIDITES SP.
- LYGISTEPOLLENITES FLORINII
- MALVACILPOLLIS DIVERSUS
- MALVACILPOLLIS SUBTILIS
- MYRTACEIDITES TENUIS
- NOTHOFAGIDITES DEMINUTUS
- NOTHOFAGIDITES EMARCUDUS/HETERUS
- NOTHOFAGIDITES FALCATUS
- NOTHOFAGIDITES GONIATUS
- PERIPOROPOLLENITES POLYPORATUS
- PODOSPORITES ANTARCTICUS
- PROTEACIDITES ANNULARIS
- PROTEACIDITES ASPEROPOLUS

FIGURE 8. BIOSTRATIGRAPHY OF TURRUM-1, TURRUM RESERVOIR

PROTEACIDITES GRANDIS
PROTEACIDITES LATROBENSIS
PROTEACIDITES PACHYPOLUS
PROTEACIDITES RETICULATUS
PROTEACIDITES SPP.
SPINIZONOCOLPITES PROMINATUS
TRICOLPITES RETICULATUS

1959.8 METERS (CONVENTIONAL CORE)

AGE : PROB MIDDLE EOCENE
N. ASPERUS

ENVIRONMENT : MARINE

FAUNA & FLORA : DINOS BROKEN

PRESERVATION : FAIR-POOR

SPECIES: OTHER
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
WOODY-COALY KEROGEN
DINOFLAGELLATES
ACRITARCH SP. 1
AREOSPHAERIDIUM SP. CF. A. FENESTRATUM
AREOSPHAERIDIUM SPP.
DEFLANDREA HETEROPHLYCTA
DEFLANDREA SPP.
SPINIFERITES SPP.
SPORES AND POLLEN
GAMBIERINA RUDATA
HALORAGACIDITES HARRISII
NOTHOFAGIDITES DEMINUTUS
NOTHOFAGIDITES FALCATUS
PROTEACIDITES ANNULARIS
PROTEACIDITES SPP.

1978.1 METERS (SIDE-WALL CORE)

AGE : PROB MIDDLE EOCENE
N. ASPERUS

ENVIRONMENT : MARINE

FAUNA & FLORA : SCANNED ONLY

FIGURE 8. BIOSTRATIGRAPHY OF TURRUM-1, TURRUM RESERVOIR

PRESERVATION : POOR

SPECIES: OTHER
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
WOODY-COALY KEROGEN
DINOFLAGELLATES
ACRITARCH SP. 1
DEFLANDREA HETEROPHLYCTA
DEFLANDREA SPP.
SPORES AND POLLEN
PROTEACIDITES SPP.

1990.2 METERS (SIDE-WALL CORE)

AGE : PROB MIDDLE EOCENE
N. ASPERUS

ENVIRONMENT : MARINE

FAUNA & FLORA : DINOS BROKEN, SCANNED

PRESERVATION : POOR-FAIR

SPECIES: OTHER
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
WOODY-COALY KEROGEN
DINOFLAGELLATES
DEFLANDREA SPP.
SPINIFERITES SPP.
SPORES AND POLLEN
BANKSIEAEIDITES ARCUATUS
CYATHIDITES SPP.
HALORAGACIDITES HARRISII
LAEVIGATOSPORITES SPP.
MALVACILPOLLIS DIVERSUS
NOTHOFAGIDITES DEMINUTUS
PROTEACIDITES LEIGHTONII
PROTEACIDITES SP. 115
PROTEACIDITES SPP.

2005.5 METERS (SIDE-WALL CORE)

FIGURE 8. BIOSTRATIGRAPHY OF TURRUM-1, TURRUM RESERVOIR

AGE : PROB MIDDLE EOCENE
N. ASPERUS

ENVIRONMENT : MARINE

FAUNA & FLORA : DINOS BROKEN, SCANNED

PRESERVATION : POOR-FAIR

SPECIES: OTHER
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
WOODY-COALY KEROGEN
DINOFLAGELLATES
AREOSPHAERIDIUM SPP.
DEFLANDREA HETEROPHLYCTA
DEFLANDREA SPP.
HYSTRICHOKOLPOMA SP. CF. H. RIGAUDIAE
OLIGOSPHAERIDIUM SP. CF. O. COMPLEX
SPINIFERITES SPP.
SPORES AND POLLEN
CYATHIDITES SPP.
HALORAGACIDITES HARRISII
LAEVIGATOSPORITES SPP.
NOTHOFAGIDITES DEMINUTUS
NOTHOFAGIDITES ENDURUS
PROTEACIDITES ANNULARIS
PROTEACIDITES SPP.

2029.9 METERS (SIDE-WALL CORE)

AGE : PROB MIDDLE EOCENE
N. ASPERUS

ENVIRONMENT : MARINE

PRESERVATION : POOR

SPECIES: OTHER
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
WOODY-COALY KEROGEN
DINOFLAGELLATES
ACRITARCH SP. 5
DEFLANDREA HETEROPHLYCTA
GLAPHYROCYSTA SP. CF. G. RETIINTEXTA
GLAPHYROCYSTA SPP.

FIGURE 8. BIOSTRATIGRAPHY OF TURRUM-1, TURRUM RESERVOIR

IMPAGIDINIUM SP. A
OLIGOSPHAERIDIUM SP. CF. O. COMPLEX
OPERCULODINIUM CENTROCARPUM
PALAEOCYSTODINIUM GOLZOWENSE
PARALECANIELLA INDENTATA
SPINIFERITES SPP.
THALASSIPHORA PATULA
UNDIFFERENTIATED FORMS

SPORES AND POLLEN

CLAVIFERA TRIPLEX
GLEICHENIIDITES SPP.
HALORAGACIDITES HARRISII
MALVACILPOLLIS DIVERSUS
MALVACILPOLLIS SUBTILIS
NOTHOFAGIDITES ASPERUS
NOTHOFAGIDITES DEMINUTUS
NOTHOFAGIDITES SP. CF. N. FALCATUS
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PROTEACIDITES ALVEOLATUS
PROTEACIDITES ANNULARIS
PROTEACIDITES SP. CF. P. ASPEROPOLUS
PROTEACIDITES CRASSUS
PROTEACIDITES SP. CF. P. GRANDIS
PROTEACIDITES LATROBENSIS
PROTEACIDITES PACHYPOLUS
PROTEACIDITES SPP.

2036.0 METERS (SIDE-WALL CORE)

AGE : PROB MIDDLE EOCENE
N. ASPERUS

ENVIRONMENT : MARGINAL MARINE

PRESERVATION : POOR

SPECIES: OTHER

AMORPHOUS KEROGEN
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
WOODY-COALY KEROGEN

DINOFLAGELLATES

GLAPHYROCYSTA SP. CF. G. RETIINTEXTA
GLAPHYROCYSTA SPP.
IMPAGIDINIUM SPP.
PARALECANIELLA INDENTATA
THALASSIPHORA PATULA

SPORES AND POLLEN

FIGURE 8. BIOSTRATIGRAPHY OF TURRUM-1, TURRUM RESERVOIR

BANKSIEAEIDITES ELONGATUS
CUPANIEIDITES ORTHOTEICHUS
GEMMATRICOLPORITES SP. CF. G. GESTUS
GLEICHENIIDITES SPP.
HALORAGACIDITES HARRISII
LYGISTEPOLLENITES FLORINII
MALVACILPOLLIS SUBTILIS
NOTHOFAGIDITES ASPERUS
NOTHOFAGIDITES DEMINUTUS
NOTHOFAGIDITES FALCATUS
NOTHOFAGIDITES SPP.
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PROTEACIDITES ANNULARIS
PROTEACIDITES ASPEROPOLUS
PROTEACIDITES LATROBENSIS
PROTEACIDITES SPP.
PROTEACIDITES STIPPLATUS
SPINIZONOCOLPITES PROMINATUS
TRICOLPITES SPP.

2054-57 METERS (DITCH SAMPLE)

AGE : MIDDLE-EARLY EOCENE?
MIXED ASSEMBLAGE

ENVIRONMENT : MARGINAL-NONMARINE

FAUNA & FLORA : ABUND CAVINGS, ESP. LT OLIG-MIOC

PRESERVATION : POOR-FAIR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN
DINOFLAGELLATES
CORDOSPHAERIDIUM SP. CF. C. INODES
DEFLANDREA HETEROPHLYCTA
DEFLANDREA SPP.
GLAPHYROCYSTA SP. CF. G. SPP.
SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
GLEICHENIIDITES SPP.
HALORAGACIDITES HARRISII
LYGISTEPOLLENITES FLORINII

FIGURE 8. BIOSTRATIGRAPHY OF TURRUM-1, TURRUM RESERVOIR

MALVACILPOLLIS DIVERSUS
NOTHOFAGIDITES BRACHYSPINULOSUS
NOTHOFAGIDITES DEMINUTUS
NOTHOFAGIDITES ENDURUS
NOTHOFAGIDITES FALCATUS
NOTHOFAGIDITES SPP.
PHYLLOCLADIDITES MAWSONII
PROTEACIDITES SPP.
SPINIZONOCOLPITES SP. CF. S. PROMINATUS
STEREISPORITES ANTIQUASPORITES

2085-88 METERS (DITCH SAMPLE)

AGE : E. LATE PALEOCENE
RC

ENVIRONMENT : MARGINAL MARINE

FAUNA & FLORA : FREQ CAVINGS W/LT EOCENE

PRESERVATION : POOR-FAIR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN
DINOFLAGELLATES
ALISOCYSTA CIRCUMTABULATA
APECTODINIUM SP. CF. A. SPP.
CERODINIUM SP. CF. C. SPECIOSUM
CORDOSPHAERIDIUM SPP.
PALAEOCYSTODINIUM SP. CF. P. GOLZOWENSE
SENEGALINIUM DILWYNENSIS
SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
CYATHIDITES SPP.
GLEICHENIIDITES SPP.
HERKOSPORITES ELLIOTII
LYGISTEPOLLENITES BALMEI
LYGISTEPOLLENITES FLORINII
NOTHOFAGIDITES ENDURUS
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES MICROSACCATUS
PROTEACIDITES ANGULALTUS
PROTEACIDITES SPP.

FIGURE 8. BIOSTRATIGRAPHY OF TURRUM-1, TURRUM RESERVOIR

STEREISPORITES ANTIQUASPORITES
TRICOLPITES GILLII

2103.0 METERS (SIDE-WALL CORE)

AGE : INDETERMINATE

ENVIRONMENT : MARGINAL MARINE

PRESERVATION : VERY POOR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN
DINOFLAGELLATES
CYCLOPSIELLA SPP.
SENEGALINIUM DILWYNENSIS
SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
BACULATISPORITES SPP.
CYATHAEIDITES GIGANTIS
CYATHIDITES SPP.
GAMBIERINA RUDATA
GLEICHENIIDITES SPP.
LAEVIGATOSPORITES SPP.
LATROBOSPORITES CRASSUS
LATROBOSPORITES OHAIENSIS
LYGISTEPOLLENITES BALMEI
LYGISTEPOLLENITES FLORINII
NOTHOFAGIDITES BRACHYSPINULOSUS
NOTHOFAGIDITES ENDURUS
PHYLLOCLADIDITES MAWSONII
PHYLLOCLADIDITES RETICULOSACCATUS
PODOCARPIDITES SPP.
PROTEACIDITES ADENANTHOIDES
PROTEACIDITES ANGULALTUS
PROTEACIDITES ANNULARIS
PROTEACIDITES SP.
PROTEACIDITES SPP.
STEREISPORITES (TRIPUNCTISPORIS) SP.
STEREISPORITES ANTIQUASPORITES
TRICOLPITES GILLII
TRICOLPITES PHILLIPSII

FIGURE 8. BIOSTRATIGRAPHY OF TURRUM-1, TURRUM RESERVOIR

2109-12 METERS (DITCH SAMPLE)

AGE : E. LATE PALEOCENE
RC

ENVIRONMENT : MARGINAL MARINE

FAUNA & FLORA : ABUN FINE PYRITE, FEW CAVINGS

PRESERVATION : POOR-FAIR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN

DINOFLAGELLATES
APECTODINIUM SP. CF. A. SPP.
CERODINIUM SP. CF. C. SPECIOSUM
CYCLOPSIELLA SPP.
GLAPHYROCYSTA RETIINTEXTA
ISABELIDINIUM SP. CF. I. SPP.
PALAEOCYSTODINIUM GOLZOWENSE
PARALECANIELLA INDENTATA
SENEGALINIUM DILWYNENSIS

SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
BACULATISPORITES SPP.
CYATHIDITES SPP.
GLEICHENIIDITES SPP.
LATROBOSPORITES CRASSUS
LATROBOSPORITES OHAIENSIS
LYGISTEPOLLENITES BALMEI
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PODOSPORITES MICROSACCATUS
PROTEACIDITES ANNULARIS
PROTEACIDITES SP. CF. P. PACHYPOLUS
PROTEACIDITES SPP.
STEREISPORITES (TRIPUNCTISPORIS) SP.
STEREISPORITES ANTIQUASPORITES

2121-24 METERS (DITCH SAMPLE)

AGE : E. LATE PALEOCENE
RC

FIGURE 8. BIOSTRATIGRAPHY OF TURRUM-1, TURRUM RESERVOIR

ENVIRONMENT : MARGINAL MARINE

FAUNA & FLORA : COMM CAVINGS

PRESERVATION : POOR-FAIR

SPECIES: OTHER
- AMORPHOUS KEROGEN
- BIODEGRADED TERRESTRIAL
- DINOFLAGELLATES-ACRITARCHS
- HERBACEOUS KEROGEN (CUTICLE)
- HERBACEOUS KEROGEN (SPORE-POLLEN)
- INDETERMINATE FINES
- WOODY-COALY KEROGEN

DINOFLAGELLATES
- APECTODINIUM HOMOMORPHUM
- APECTODINIUM SP. CF. A. SPP.
- CERODINIUM SP. CF. C. SPECIOSUM
- DEFLANDREA SPP.
- GLAPHYROCYSTA RETIINTEXTA
- ISABELIDINIUM SPP.

SPORES AND POLLEN
- LYGISTEPOLLENITES BALMEI
- NOTHOFAGIDITES ENDURUS
- PHYLLOCLADIDITES MAWSONII
- PODOCARPIDITES SPP.
- PODOSPORITES MICROSACCATUS
- PROTEACIDITES ANGULALTUS
- STEREISPORITES ANTIQUASPORITES

2140-43 METERS (DITCH SAMPLE)

AGE : E. LATE PALEOCENE
RC

ENVIRONMENT : MARGINAL MARINE

FAUNA & FLORA : ABUN CAVINGS

PRESERVATION : POOR-FAIR

SPECIES: OTHER
- AMORPHOUS KEROGEN
- BIODEGRADED TERRESTRIAL
- DINOFLAGELLATES-ACRITARCHS
- HERBACEOUS KEROGEN (CUTICLE)
- HERBACEOUS KEROGEN (SPORE-POLLEN)
- INDETERMINATE FINES
- WOODY-COALY KEROGEN

DINOFLAGELLATES

FIGURE 8. BIOSTRATIGRAPHY OF TURRUM-1, TURRUM RESERVOIR

APECTODINIUM SP. CF. A. SPP.
DEFLANDREA SPP.
GLAPHYROCYSTA RETIINTEXTA
PALAEOCYSTODINIUM GOLZOWENSE
SENEGALINIUM DILWYNENSIS

SPORES AND POLLEN

LAEVIGATOSPORITES SPP.
LYGISTEPOLLENITES BALMEI
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.

2151.8 METERS (CONVENTIONAL CORE)

AGE : L. EARLY PALEOCENE?
RD1?

ENVIRONMENT : NONMARINE

FAUNA & FLORA : MIXED ASSEMBLAGE IN SS

PRESERVATION : FAIR-GOOD

SPECIES: OTHER

AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN

SPORES AND POLLEN

AUSTALOPOLLIS OBSCURUS
BACULATISPORITES SPP.
CICATRICOSISPORITES SPP.
CLAVIFERA TRIPLEX
CYATHAEIDITES GIGANTIS
CYATHIDITES SPP.
DILWYNITES TUBERCULATUS
ERICIPITES SPP.
GAMBIERINA EDWARSII
GAMBIERINA RUDATA
GLEICHENIIDITES SPP.
LAEVIGATOSPORITES SPP.
LATROBOSPORITES CRASSUS
LYGISTEPOLLENITES BALMEI
LYGISTEPOLLENITES FLORINII
NOTHOFAGIDITES ENDURUS
NOTHOFAGIDITES SP. CF. N. FALCATUS
PEROMONOLETES DENSUS
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.

FIGURE 8. BIOSTRATIGRAPHY OF TURRUM-1, TURRUM RESERVOIR

PODOSPORITES ANTARCTICUS
PODOSPORITES MICROSACCATUS
PROTEACIDITES ANGULALTUS
PROTEACIDITES SP. CF. P. ANNULARIS
PROTEACIDITES SP.
PROTEACIDITES SPP.
STEREISPORITES (TRIPUNCTISPORIS) SP.
STEREISPORITES ANTIQUASPORITES
TRICOLPITES RETICULATUS
TRICOLPITES SP. 100
TRICOLPITES SPP.
VERRUCOSISPORITES SPP.

2158.9 METERS (CONVENTIONAL CORE)

AGE : L. EARLY PALEOCENE?
RD1?

ENVIRONMENT : MARGINAL MARINE

PRESERVATION : FAIR-POOR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN
DINOFLAGELLATES
CORDOSPHAERIDIUM SP. CF. C. SPP.
GLAPHYROCYSTA RETIINTEXTA
PALAEOCYSTODINIUM GOLZOWENSE
PARALECANIELLA INDENTATA
SENEGALINIUM DILWYNENSIS
SPINIFERITES SPP.
UNDIFFERENTIATED FORMS
SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
CYATHAEIDITES GIGANTIS
CYATHIDITES SPP.
GAMBIERINA RUDATA
GLEICHENIIDITES SPP.
HERKOSPORITES ELLIOTII
LAEVIGATOSPORITES SPP.
LYGISTEPOLLENITES BALMEI
LYGISTEPOLLENITES FLORINII
NOTHOFAGIDITES BRACHYSPINULOSUS
NOTHOFAGIDITES ENDURUS

FIGURE 8. BIOSTRATIGRAPHY OF TURRUM-1, TURRUM RESERVOIR

NOTHOFAGIDITES GONIATUS
PEROMONOLETES DENSUS
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PODOSPORITES MICROSACCATUS
PROTEACIDITES ANGULALTUS
PROTEACIDITES SP.
PROTEACIDITES SPP.
STEREISPORITES (TRIPUNCTISPORIS) SP.
STEREISPORITES ANTIQUASPORITES
TRICOLPITES GILLII
TRICOLPITES SPP.
TRICOLPORITES SPP.

2168.9 METERS (CONVENTIONAL CORE)

AGE : L. EARLY PALEOCENE
RD1

ENVIRONMENT : MARINE

PRESERVATION : POOR-FAIR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN
DINOFLAGELLATES
ALISOCYSTA RETICULATA
CERODINIUM SP. CF. C. SPECIOSUM
DEFLANDREA SP. CF. D. DARTMOORIA
DEFLANDREA SPP.
GLAPHYROCYSTA RETIINTEXTA
GLAPHYROCYSTA SPP.
HYSTRICHOSPHAERIDIUM SP.
ISABELIDINIUM BAKERI
SENEGALINIUM DILWYNENSIS
SPINIDINIUM SP. AFF. S. DENSISPINATUM
SPINIDINIUM SP. CF. S. ESSOI
SPINIDINIUM MACMURDOENSE
SPINIDINIUM SPP.
SPINIFERITES SPP.
UNDIFFERENTIATED FORMS
VOZZHENNIKOVIA ANGULATA
VOZZHENNIKOVIA SPP.

FIGURE 8. BIOSTRATIGRAPHY OF TURRUM-1, TURRUM RESERVOIR

SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
CICATRICOSISPORITES SPP.
CYATHAEIDITES GIGANTIS
CYATHIDITES SPP.
GLEICHENIIDITES SPP.
LAEVIGATOSPORITES SPP.
LYGISTEPOLLENITES BALMEI
LYGISTEPOLLENITES FLORINII
NOTHOFAGIDITES ENDURUS
PEROMONOLETES DENSUS
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PODOSPORITES MICROSACCATUS
PROTEACIDITES ANGULALTUS
PROTEACIDITES SP.
PROTEACIDITES SPP.
PROTEACIDITES SP. CF. P. STIPPLATUS
PROTEACIDITES TENUIEXINUS
STEREISPORITES ANTIQUASPORITES
TETRACOLPORITES VERRUCOSUS

2184.1 METERS (CONVENTIONAL CORE)

AGE : INDETERMINATE

ENVIRONMENT : NONMARINE

FAUNA & FLORA : SANDSTONE

PRESERVATION : POOR-FAIR

SPECIES: OTHER
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
WOODY-COALY KEROGEN
DINOFLAGELLATES
CORDOSPHAERIDIUM SPP.
SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
CYATHAEIDITES GIGANTIS
CYATHIDITES SPP.
ERICIPITES SPP.
GLEICHENIIDITES SPP.
LAEVIGATOSPORITES SPP.
LYGISTEPOLLENITES BALMEI
NOTHOFAGIDITES BRACHYSPINULOSUS
PHYLLOCLADIDITES MAWSONII

FIGURE 8. BIOSTRATIGRAPHY OF TURRUM-1, TURRUM RESERVOIR

PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PODOSPORITES MICROSACCATUS
PROTEACIDITES ANGULALTUS
PROTEACIDITES SPP.
TRICOLPITES SPP.

2190.5 METERS (CONVENTIONAL CORE)

AGE : INDETERMINATE

ENVIRONMENT : NONMARINE

PRESERVATION : POOR

SPECIES: OTHER
AMORPHOUS KEROGEN
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
WOODY-COALY KEROGEN
SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
CYATHAEIDITES GIGANTIS
CYATHIDITES SPP.
GAMBIERINA RUDATA
GLEICHENIIDITES SPP.
LAEVIGATOSPORITES SPP.
LYGISTEPOLLENITES BALMEI
MALVACILPOLLIS DIVERSUS
NOTHOFAGIDITES FLEMINGII
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PODOSPORITES MICROSACCATUS
PROTEACIDITES SP.
PROTEACIDITES SPP.
TRICOLPITES SPP.

2211.2 METERS (SIDE-WALL CORE)

AGE : INDETERMINATE

ENVIRONMENT : NONMARINE

FAUNA & FLORA : NEARLY BARREN

PRESERVATION : POOR

FIGURE 8. BIOSTRATIGRAPHY OF TURRUM-1, TURRUM RESERVOIR

SPECIES: OTHER
HERBACEOUS KEROGEN (SPORE-POLLEN)
WOODY-COALY KEROGEN
SPORES AND POLLEN
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PROTEACIDITES SPP.
TRICOLPITES SPP.

2234-37 METERS (DITCH SAMPLE)

AGE : EARLY PALEOCENE
RD2

ENVIRONMENT : NON-MARGINAL MARINE

PRESERVATION : POOR-FAIR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN
DINOFLAGELLATES
CERODINIUM SP. CF. C. SPECIOSUM
DEFLANDREA SPP.
VOZZHENNIKOVIA APERTURA
SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
DILWYNITES TUBERCULATUS
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PODOSPORITES MICROSACCATUS
PROTEACIDITES ANGULALTUS
PROTEACIDITES SPP.
STEREISPORITES ANTIQUASPORITES
TETRACOLPORITES SP. CF. T. VERRUCOSUS
TRICOLPITES PHILLIPSII

2252-59 METERS (DITCH SAMPLE)

AGE : EARLY PALEOCENE
RD2

FIGURE 8. BIOSTRATIGRAPHY OF TURRUM-1, TURRUM RESERVOIR

ENVIRONMENT : MARGINAL MARINE-MARINE

FAUNA & FLORA : CAVED FORMS COMMON

PRESERVATION : FAIR

SPECIES: OTHER
- AMORPHOUS KEROGEN
- BIODEGRADED TERRESTRIAL
- DINOFLAGELLATES-ACRITARCHS
- HERBACEOUS KEROGEN (CUTICLE)
- HERBACEOUS KEROGEN (SPORE-POLLEN)
- INDETERMINATE FINES
- WOODY-COALY KEROGEN

DINOFLAGELLATES
- APECTODINIUM SP. CF. A. SPP.
- CERODINIUM SP. CF. C. SPECIOSUM
- DEFLANDREA SPP.
- GLAPHYROCYSTA RETIINTEXTA
- GLAPHYROCYSTA SPP.
- INDETERMINATE DINOFLAGELLATES
- MICRHYSTRIDIUM SPP.
- OPERCULODINIUM CENTROCARPUM
- SENEGALINIUM DILWYNENSIS
- SPINIDINIUM SP. CF. S. DENSISPINATUM
- SPINIDINIUM SPP.
- SPINIFERITES SPP.
- VOZZHENNIKOVIA ANGULATA
- VOZZHENNIKOVIA SPP.

SPORES AND POLLEN
- AUSTALOPOLLIS OBSCURUS
- CYATHIDITES SPP.
- DILWYNITES TUBERCULATUS
- GAMBIERINA RUDATA
- GLEICHENIIDITES SPP.
- LAEVIGATOSPORITES SPP.
- LYGISTEPOLLENITES BALMEI
- NOTHOFAGIDITES ENDURUS
- PHYLLOCLADIDITES MAWSONII
- PODOCARPIDITES SPP.
- PODOSPORITES ANTARCTICUS
- PODOSPORITES MICROSACCATUS
- PROTEACIDITES ANGULALTUS
- PROTEACIDITES SPP.
- STEREISPORITES ANTIQUASPORITES
- TETRACOLPORITES VERRUCOSUS
- TRICOLPITES GILLII
- TRICOLPITES SPP.

2270.6 METERS (SIDE-WALL CORE)

FIGURE 8. BIOSTRATIGRAPHY OF TURRUM-1, TURRUM RESERVOIR

AGE : INDETERMINATE

ENVIRONMENT : NONMARINE

FAUNA & FLORA : MINOR CONTAM., T VANCAMP.

PRESERVATION : POOR-FAIR

SPECIES: OTHER
- HERBACEOUS KEROGEN (CUTICLE)
- HERBACEOUS KEROGEN (SPORE-POLLEN)
- WOODY-COALY KEROGEN

DINOFLAGELLATES
- SPINIDINIUM SP. AFF. S. DENSISPINATUM
- UNDIFFERENTIATED FORMS

SPORES AND POLLEN
- AUSTALOPOLLIS OBSCURUS
- BACULATISPORITES SPP.
- CHOMOTRILETES SPP.
- CLAVIFERA TRIPLEX
- CYATHAEIDITES GIGANTIS
- CYATHIDITES SPP.
- GAMBIERINA EDWARSII
- GLEICHENIIDITES SPP.
- HERKOSPORITES ELLIOTII
- LAEVIGATOSPORITES SPP.
- LATROBOSPORITES CRASSUS
- LILIACIDITES SPP.
- LYGISTEPOLLENITES BALMEI
- LYGISTEPOLLENITES FLORINII
- NOTHOFAGIDITES ENDURUS
- PEROMONOLETES DENSUS
- PHYLLOCLADIDITES MAWSONII
- PODOCARPIDITES SPP.
- PODOSPORITES ANTARCTICUS
- PODOSPORITES MICROSACCATUS
- PROTEACIDITES ANGULALTUS
- PROTEACIDITES SP.
- PROTEACIDITES SPP.
- PROTEACIDITES SP. CF. P. TENUIEXINUS
- STEREISPORITES (TRIPUNCTISPORIS) SP.
- STEREISPORITES ANTIQUASPORITES
- STEREISPORITES REGIUM
- TRICOLPITES SP. CF. T. CONFESSUS
- TRICOLPITES SPP.

2271-74 METERS (DITCH SAMPLE)

AGE : INDETERMINATE

FIGURE 8. BIOSTRATIGRAPHY OF TURRUM-1, TURRUM RESERVOIR

ENVIRONMENT : NONMARINE

FAUNA & FLORA : COMM CAVINGS

PRESERVATION : POOR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN
DINOFLAGELLATES
SENEGALINIUM DILWYNENSIS
SPINIDINIUM SPP.
SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PODOSPORITES MICROSACCATUS
PROTEACIDITES SPP.

2295-98 METERS (DITCH SAMPLE)

AGE : E. PALEOC.-?L. MAAST.?
RF?

ENVIRONMENT : NONMARINE

FAUNA & FLORA : FEW CAVINGS

PRESERVATION : POOR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN
SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
CYATHIDITES SPP.
GAMBIERINA EDWARSII
GLEICHENIIDITES SPP.
LAEVIGATOSPORITES SPP.
LYGISTEPOLLENITES BALMEI

FIGURE 8. BIOSTRATIGRAPHY OF TURRUM-1, TURRUM RESERVOIR

PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES MICROSACCATUS
PROTEACIDITES ANGULALTUS
PROTEACIDITES SPP.
STEREISPORITES ANTIQUASPORITES
TRICOLPITES GILLII
TRICOLPITES SPP.

2310-13 METERS (DITCH SAMPLE)

AGE : E. PALEOC.-?L. MAAST.?
RF?

ENVIRONMENT : NONMARINE

FAUNA & FLORA : RARE PALYNOMORPHS

PRESERVATION : POOR-FAIR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN
SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
GAMBIERINA EDWARSII
GLEICHENIIDITES SPP.
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES MICROSACCATUS
PROTEACIDITES ANGULALTUS
PROTEACIDITES SPP.
STEREISPORITES (TRIPUNCTISPORIS) SP.
STEREISPORITES ANTIQUASPORITES
TRICOLPITES SPP.

2335-38 METERS (DITCH SAMPLE)

AGE : E. PALEOC.-?L. MAAST.?
RF?

ENVIRONMENT : NONMARINE

FAUNA & FLORA : FEW CAVINGS

FIGURE 8. BIOSTRATIGRAPHY OF TURRUM-1, TURRUM RESERVOIR

PRESERVATION : FAIR-POOR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN

SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
BACULATISPORITES SPP.
CYATHIDITES SPP.
GLEICHENIIDITES SPP.
LAEVIGATOSPORITES SPP.
LYGISTEPOLLENITES BALMEI
LYGISTEPOLLENITES FLORINII
PODOCARPIDITES SPP.
PODOSPORITES MICROSACCATUS
PROTEACIDITES ANGULALTUS
PROTEACIDITES SPP.
STEREISPORITES (TRIPUNCTISPORIS) SP.
STEREISPORITES ANTIQUASPORITES
TETRACOLPORITES VERRUCOSUS
TRICOLPITES SP. CF. T. CONFESSUS
TRICOLPITES GILLII
TRICOLPITES SPP.
TRICOLPORITES SPP.

2365-68 METERS (DITCH SAMPLE)

AGE : E. PALEOC.-?L. MAAST.
RF

ENVIRONMENT : NONMARINE

FAUNA & FLORA : RARE CAVINGS

PRESERVATION : POOR-FAIR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN

SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
CHOMOTRILETES SPP.

FIGURE 8. BIOSTRATIGRAPHY OF TURRUM-1, TURRUM RESERVOIR

CYATHIDITES SPP.
EPHEDRIPITES SPP.
LAEVIGATOSPORITES SPP.
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES MICROSACCATUS
PROTEACIDITES ANGULALTUS
PROTEACIDITES SPP.
STEREISPORITES ANTIQUASPORITES
TETRACOLPORITES VERRUCOSUS
TRICOLPITES SP. CF. T. CONFESSUS
TRICOLPITES GILLII
TRICOLPITES SPP.

2387-90 METERS (DITCH SAMPLE)

AGE : INDETERMINATE

ENVIRONMENT : NONMARINE

PRESERVATION : POOR-FAIR

SPECIES: OTHER
AMORPHOUS KEROGEN
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
WOODY-COALY KEROGEN
SPORES AND POLLEN
CYATHIDITES SPP.
EPHEDRIPITES SPP.
TRICOLPORITES SPP.

2405-8 METERS (DITCH SAMPLE)

AGE : INDETERMINATE
RG?

ENVIRONMENT : MARGINAL?-NONMARINE

FAUNA & FLORA : FEW CAVINGS

PRESERVATION : POOR-FAIR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS

FIGURE 8. BIOSTRATIGRAPHY OF TURRUM-1, TURRUM RESERVOIR

PROTEACIDITES ANNULARIS
PROTEACIDITES SP.
PROTEACIDITES SPP.
STEREISPORITES ANTIQUASPORITES
TRICOLPITES PHILLIPSII
TRICOLPITES SPP.
TRICOLPORITES SPP.

2435-38 METERS (DITCH SAMPLE)

AGE : INDETERMINATE

ENVIRONMENT : NONMARINE

FAUNA & FLORA : FEW CAVINGS

PRESERVATION : POOR-FAIR

SPECIES: OTHER
AMORPHOUS KEROGEN
BIODEGRADED TERRESTRIAL
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
INDETERMINATE FINES
WOODY-COALY KEROGEN
SPORES AND POLLEN
AUSTALOPOLLIS OBSCURUS
BACULATISPORITES SPP.
CYATHIDITES SPP.
GLEICHENIIDITES SPP.
LAEVIGATOSPORITES SPP.
LYGISTEPOLLENITES FLORINII
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES MICROSACCATUS
PROTEACIDITES ANGULALTUS
PROTEACIDITES SPP.
TETRACOLPORITES VERRUCOSUS
TRICOLPITES SP. CF. T. CONFESSUS
TRICOLPITES GILLII
TRICOLPITES SPP.

2438.3 METERS (SIDE-WALL CORE)

AGE : INDETERMINATE
RG?

FIGURE 8. BIOSTRATIGRAPHY OF TURRUM-1, TURRUM RESERVOIR

ENVIRONMENT : MARGINAL-NONMARINE

FAUNA & FLORA : SOME MUD CONTAMINATION

PRESERVATION : POOR-FAIR

SPECIES: OTHER
- BIODEGRADED TERRESTRIAL
- HERBACEOUS KEROGEN (CUTICLE)
- HERBACEOUS KEROGEN (SPORE-POLLEN)
- WOODY-COALY KEROGEN

DINOFLAGELLATES
- CORDOSPHAERIDIUM SPP.
- DEFLANDREA SPP.
- SENEGALINIUM DILWYNENSIS

SPORES AND POLLEN
- CYATHIDITES SPP.
- GAMBIERINA EDWARSII
- GLEICHENIIDITES SPP.
- ISCHYOSPORITES IRREGULARIS
- LAEVIGATOSPORITES SPP.
- PHYLLOCLADIDITES MAWSONII
- PODOCARPIDITES SPP.
- PODOSPORITES ANTARCTICUS
- PROTEACIDITES ANGULALTUS
- PROTEACIDITES SPP.
- STEREISPORITES ANTIQUASPORITES
- TRICOLPITES GILLII

2438-43 METERS (DITCH SAMPLE)

AGE : INDETERMINATE

ENVIRONMENT : NONMARINE

PRESERVATION : POOR-FAIR

SPECIES: OTHER
- BIODEGRADED TERRESTRIAL
- HERBACEOUS KEROGEN (CUTICLE)
- HERBACEOUS KEROGEN (SPORE-POLLEN)
- WOODY-COALY KEROGEN

SPORES AND POLLEN
- AUSTALOPOLLIS OBSCURUS
- BACULATISPORITES SPP.
- CLAVIFERA TRIPLEX
- CYATHIDITES SPP.
- DILWYNITES SP. CF. D. TUBERCULATUS
- GAMBIERINA RUDATA
- GLEICHENIIDITES SPP.

FIGURE 8. BIOSTRATIGRAPHY OF TURRUM-1, TURRUM RESERVOIR

LAEVIGATOSPORITES SPP.
LATROBOSPORITES OHAIENSIS
LYGISTEPOLLENITES FLORINII
PHYLLOCLADIDITES MAWSONII
PHYLLOCLADIDITES RETICULOSACCATUS
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PODOSPORITES MICROSACCATUS
PROTEACIDITES SP.
PROTEACIDITES SPP.
STEREISPORITES (TRIPUNCTISPORIS) SP.
STEREISPORITES ANTIQUASPORITES

2481.6 METERS (SIDE-WALL CORE)

AGE : LATE MAASTRICHTIAN
MA

ENVIRONMENT : MARGINAL-NONMARINE

FAUNA & FLORA : SOME MUD CONTAMINATION

PRESERVATION : POOR-FAIR

SPECIES: OTHER
BIODEGRADED TERRESTRIAL
DINOFLAGELLATES-ACRITARCHS
HERBACEOUS KEROGEN (CUTICLE)
HERBACEOUS KEROGEN (SPORE-POLLEN)
WOODY-COALY KEROGEN
DINOFLAGELLATES
ISABELIDINIUM SP. CF. I. BAKERI
SPORES AND POLLEN
ARAUCARIACITES AUSTRALIS
AUSTALOPOLLIS OBSCURUS
CYATHIDITES SPP.
GAMBIERINA EDWARSII
GAMBIERINA RUDATA
GLEICHENIIDITES SPP.
ISCHYOSPORITES IRREGULARIS
LAEVIGATOSPORITES SPP.
LATROBOSPORITES OHAIENSIS
LILIACIDITES SP.
LYCOPODIUMSPORITES SPP.
PHYLLOCLADIDITES MAWSONII
PODOCARPIDITES SPP.
PODOSPORITES ANTARCTICUS
PROTEACIDITES ADENANTHOIDES
PROTEACIDITES ANGULALTUS
PROTEACIDITES SP.

FIGURE 8. BIOSTRATIGRAPHY OF TURRUM-1, TURRUM RESERVOIR

PROTEACIDITES SPP.
STEREISPORITES ANTIQUASPORITES
TETRACOLPORITES VERRUCOSUS
TRICLOPITES PACHYEXINUS
TRICOLPITES GILLII
TRICOLPITES LONGUS