

PECTEN INTERNATIONAL COMPANY

PARTNERSHIP PROPOSAL

SOMALI DEMOCRATIC REPUBLIC



Somali Nomad (12/87)

OFFSHORE BLOCKS

M-3, M-4, M-5, M-6, and M-7



TRANSMITTAL MEMO

TO

COMPANY	PECTEN INTERNATIONAL COMPANY
COUNTRY	SOMALIA
AREA/PLAY	OFFSHORE BLOCKS M-3 THRU M-7

THE FOLLOWING HAS BEEN TRANSMITTED			
QTY.	KIND	DESCRIPTION	FILE NO.
1	3-Ring Notebook	Partnership Proposal - Blocks M-3 thru M-7 Somali Democratic Republic	
1	Folder	Somalia Partnership Proposal - Seismic Enclosures	
(See attached Table of Contents)			

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SOMALIA
CONFIDENTIALITY AGREEMENT

This Agreement is made and entered into this ___ day of _____, 1989 by and between Pecten Somalia Company ("Pecten") and _____ ("Company"), collectively referred to as "Parties".

Pecten holds certain geological, geophysical and other technical data, including interpretations ("data"), applicable to the Concession Agreement for The Exploration and Mining of Hydrocarbons in Blocks M-3, M-4, M-5, M-6 and M-7 in the Somali Democratic Republic, dated November 1, 1988, between the Government of Somalia and Pecten ("Concession"); the data and Concession are collectively referred to as "Confidential Information".

Company has expressed an interest in reviewing such Confidential Information solely for the purpose of determining Company's interest in acquiring rights under the Concession.

Pecten is willing to disclose to Company the Confidential Information on the following terms and conditions:

1. The Confidential Information shall be used solely in connection with the aforementioned purpose and shall not be used to adversely affect the business of Pecten in any way.
 2. All Confidential Information shall be kept strictly confidential, and shall not, without the prior written consent of Pecten, be disclosed to any party, other than an affiliate of Company in any manner whatsoever. As a condition of such disclosure, said Affiliate shall be bound by the terms and conditions hereof. The term "Affiliate" as used herein includes any corporation, partnership, trust or other entity, that to the extent of at least fifty percent (50%), directly or indirectly owns or controls, is owned or controlled by, and/or is under common ownership or control with Company.
 3. Company will limit access to the Confidential Information to those of its employees who reasonably require the same for consideration of the proposal and who are obligated to treat the same as confidential in the same manner and to the same extent as herein provided.
 4. Company may disclose the Confidential Information without Pecten's prior written consent if and to the extent that such Confidential Information:
 - (a) is already known to Company (or an affiliate) as of the date of disclosure hereunder;
 - (b) is already in possession of the public or becomes available to the public through no fault of Company; or
 - (c) is required to be disclosed under applicable law or by a governmental authority or stock exchange.
-

Pecten Somalia Proposal

5. In the event Pecten and Company do not execute an agreement wherein Company acquires rights in the Concession, Company shall promptly return all Confidential Information received from Pecten along with any copies thereof.
6. This Agreement shall be effective as of the date referenced above and shall continue until the expiration, termination or surrender of Pecten's rights in the Concession, or three (3) years from the effective date of this Agreement, whichever is later.

PECTEN SOMALIA COMPANY

By: _____

Title: _____

By: _____

Title: _____

Exploration Potential: Offshore Somalia Blocks M-3 through M-7

J. L. Fritz, M. R. Cooper, R. W. Forster

Pecten Somalia Company
Houston, Texas

January, 1989

INTRODUCTION

The Somalia Coastal Basins extend along the passive continental margin of East Africa for 1850 kilometers (1150 miles) from the Horn of Africa to the Kenyan border. These basins cover a narrow shelf, 8 to 80 kilometers wide (average 12 km) and extend onshore from 80 to 300 kilometers. Almost 1200 kilometers (750 miles) are encompassed by the 5 offshore blocks M-3 through M-7 (14.9 MM acres) (Figure 1). In a portion of Blocks M-4 and M-5 (Figure 2), a structural province, the Gems Area, has been identified which contains at least 19 leads and prospects. These leads include dramatic compressional structures that map as large simple and faulted folds (Figure 3). These large structural traps form the basis for the primary play in this large acreage block. In addition, the 19 nearby wells and the previously acquired seismic data indicate the potential for several other types of plays along this 1200 kilometer stretch of passive margin.

STRUCTURE AND STRATIGRAPHY

The oldest post-Karoo sequence that outcrops and which has been penetrated by wells in Somalia and Ethiopia is the Triassic-Early Jurassic Adigrat sandstone, a fluvial-lacustrine? sequence with a poorly understood distribution.

This continental sequence is overlain by a thick, extensive carbonate platform which covered the Horn of Africa, the Arabian platform, and Madagascar, and which extended throughout much of Somalia during the Middle and Late Jurassic. This carbonate platform was disrupted by Late Jurassic rifting and drifting marking the breakup of Gondwana and the separation of Somalia and Madagascar. This Jurassic carbonate sequence was then transgressed by extensive Lower and Upper Cretaceous shelf carbonates and evaporites with associated basin edge fluvial clastics. These units in turn were unconformably overlain by Tertiary mixed clastics and carbonates typical of a passive margin setting (Figure 4).

This stratigraphic sequence has provided multiple opportunities for reservoirs and seals as summarized by a generalized stratigraphic picture in Figure 5. Both carbonate and clastic reservoirs have been penetrated in wells, and include Upper Cretaceous reefal (rudistid) limestones and oolitic grainstones with porous sections (20-30% porosity) up to 490 meters (1600 feet) thick (El Hamurre-1). Porous Upper Cretaceous chalky grainstones have been penetrated in Garad Mare-1 (28% porosity). Middle Jurassic dolomites have been encountered with sucrosic and vuggy porosity in the 15-25% range. The basal Mesozoic Adigrat sandstone is an important secondary objective with 15-20% porosities, while Late Cretaceous porous turbidite sands

with oil and condensate recoveries have been penetrated in the Coriole basin to the south.

Potential sealing facies are abundant and include Middle Jurassic basinal shales, the Upper Jurassic Uarandab shale, and Lower Cretaceous shales as well as evaporites. A thick early Tertiary shale section, resting unconformably on Upper Cretaceous carbonate reservoirs, was penetrated in Garad Mare-1.

The stratigraphic sequences penetrated in wells drilled in the Somalia Coastal Basins indicate significant stratigraphic variation along this 1200 kilometer (750 mile) coastline. This stratigraphic variation increases the potential for numerous plays (Figure 6) along this stretch of coast where only 2 offshore wells have been drilled within Blocks M-3 thru M-7.

HYDROCARBON SHOWS AND SOURCE ROCKS

The 30-year hydrocarbon exploration history in Somalia has resulted in only 67 wells in a country slightly larger than the state of Texas. No production has been established in the country as is the case for all of the countries in East Africa. However, some of the best oil recoveries anywhere along the East African margin have occurred in the Coriole Basin near Mogadishu.

Afgoi 1, 2 and 3 have reportedly recovered up to 8400 MCF/D of gas and 42 bbls of 51 degree API gravity condensate. Afgoi 2 and 3 failed to prove economic quantities of hydrocarbons and a proposed development plan was dropped. Coriole 1 and 2 recovered up to 100 BOPD and 2080 MCF/D of gas from Cretaceous sandstones and from fractured volcanics intruding the Cretaceous section. Twelve barrels-per-day of 41 degree API oil were also recovered

from Eocene dolomites in Coriole 1. The other significant hydrocarbon recoveries in the region have come out of the Ogaden portion of Ethiopia and from the Dagah Shabel region in northern Somalia. In the Ogaden, an estimated 0.9 TCF of gas have been discovered at the Calub gas field. No production has yet been established. Small amounts of oil (30-51 degree API) have also been recovered from several wells in the Ogaden from Triassic/Lower Jurassic sandstones and Middle Jurassic carbonates. Several wells drilled near the oil seep at Dagah Shabel recovered up to 21 bbls of 27-34 degree API gravity oil from both Jurassic limestones and Upper Cretaceous sandstone.

Other indications of hydrocarbons in the form of oil stains, dead oil, fluorescence, and gas shows have been reported from many of the wells drilled in Somalia. The significance and reliability of these reports remain undetermined.

Figure 7, a Middle to Late Jurassic paleoreconstruction, summarizes much of the regional evidence for hydrocarbon generation, illustrating in particular, the 23.2 BB of heavy oil and tar in Madagascar and the 500 MMBO in the Jurassic of North Yemen.

A regional uniform source rock package has not been identified by the drilling history in Somalia. Many of the older wells have not been thoroughly evaluated for source rock potential since access to well samples is a significant problem. However, source rock data accumulated from numerous sources, indicate scattered occurrences of marginal to excellent source rocks in several stratigraphic packages. These are schematically illustrated in Figure 5. Thickness and areal distribution of each of these identified packages remains unknown and is the subject of ongoing evaluation. Table 1 summarizes some of the source rock indications which have been identified.

Table 1
Summary of Source Rock Indications

Well Name	Age	Maximum % TOC
Buran	Upper Cretaceous	4.2
En Dibirre	Upper Cretaceous	6.2
El Bur	Upper Cretaceous	3.5
Afgoi 3	Upper Cretaceous	3.8
Calub	Lower Cretaceous	5.6
Magan (Ethiopia)	Upper Jurassic	6.8
Hilala 2 (Ethiopia)	Upper Jurassic	3.1
El Kuran (Ethiopia)	Upper Jurassic	7.1
El Cabobe	Middle Jurassic	5.9
El Cabobe	Triassic/L. Jurassic	12.9
El Kuran (Ethiopia)	Triassic/L. Jurassic	6.0
Cotton	Triassic/L. Jurassic	6.2

GEMS AREA PLAY

The primary play identified within Blocks M-3 through M-7 has been recognized in the northern portion of M-4 and the southern portion of M-5 (Gems Area) (Figure 8).

This area is covered with a roughly 4 km x 4 km seismic grid acquired in 1974 and 1975 for Conoco in joint venture with Pecten and AGIP (Figure 8). The 1974 CGG data set comprises 1283 km of data, while the 1975 G.S.I. data includes 1356 km.

Although the structures of the primary play were clearly visible on the contractor sections, Pecten elected to reprocess 17 lines (599 km) in the vicinity of the Garad Mare-1 well. All these lines were processed through poststack migration, and most had dip moveout applied. The goals of this reprocessing were: 1) refine the

appearance of the Upper Cretaceous unconformity, and; 2) enhance the character of the Upper Cretaceous section. See lines 75-105 through 75-116 (Seismic enclosures) for examples of the DMOed and migrated sections, and 74-5 or 74-22 for examples of a contractor's stack from the 1974 data set.

Recent Pecten interpretation of this data has identified at least 19 significant leads and prospects, both simple folds and faulted structures, and which lie in 90-490 meters (300 to 1800 feet) of water (Figures 9 and 10).

In 1977, AGIP drilled Garad Mare-1, approximately 12 kilometers (7 miles) shoreward of the mapped trend of structures. Although drilled on a high block, Pecten's interpretation indicates that the Garad Mare 1 does not test a closed structure (Figure 11).

Figures 12 and 13 summarize the stratigraphy encountered in the well and illustrates the stratigraphic correlations with the mapped seismic horizons. A thick Paleocene through Lower Miocene shale section provides a tremendous seal on the Upper Cretaceous carbonates. Petrophysical interpretation of the Upper Cretaceous section indicates at least 225 meters (1400 feet) of porous carbonates with porosities greater than 20%. Lithologic descriptions indicate these intervals are predominantly chalky grainstones. Porosity/permeability trend curves for similar carbonate rock types in Syria and Oman indicate permeabilities on the order of 10 md can be expected. These estimates await confirmation once well samples from this interval are obtained.

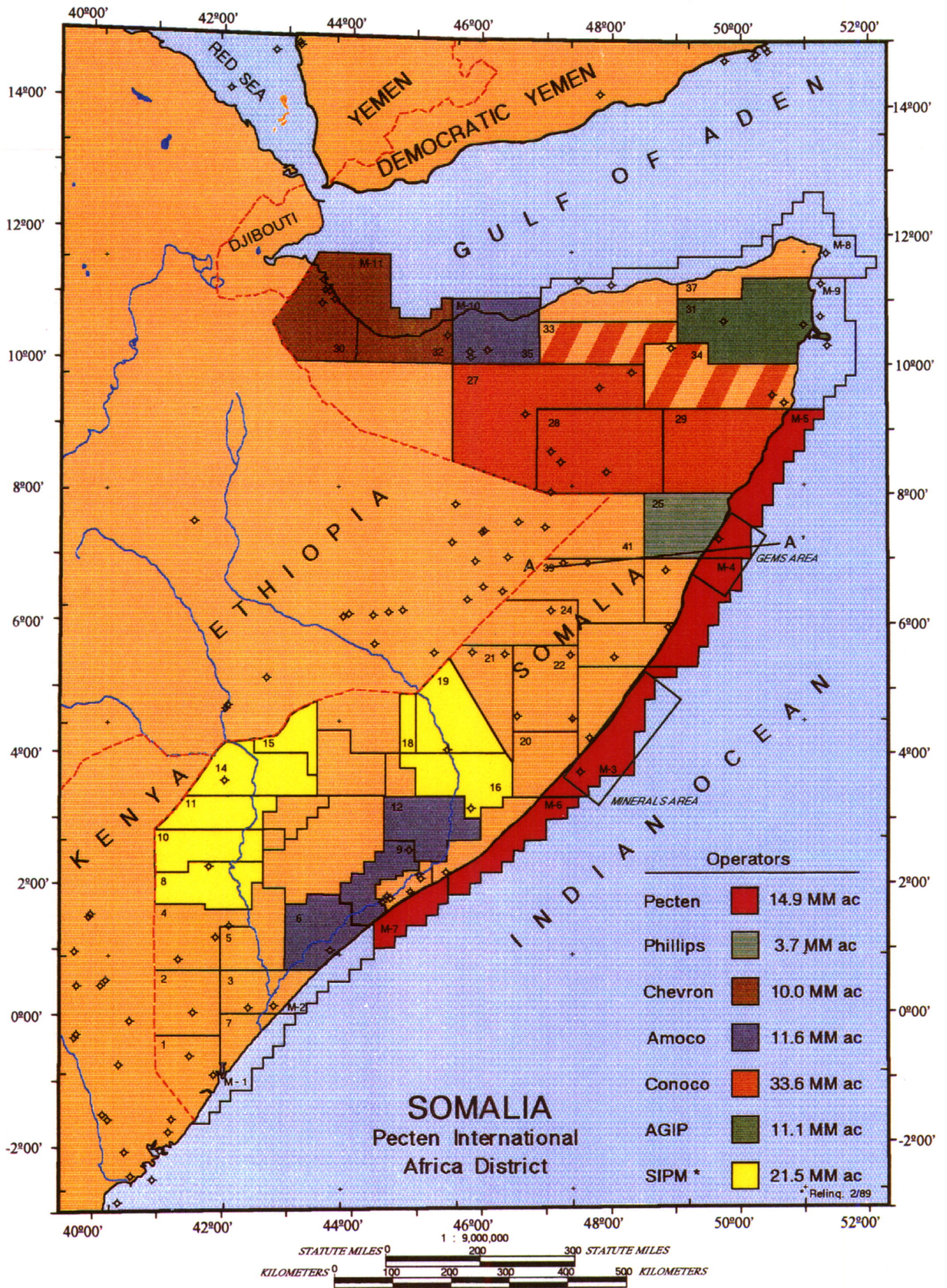
Vitrinite reflectance data collected by Robertson Research indicate a normal VR-vs-Depth trend with the top of the estimated oil maturity window at 2550 meters (8350 feet) (Figure 14). This places the Jurassic section, a major potential source rock interval, in the oil maturity window over most of the Gems Area.

Figure 15, which illustrates seismic line 75-116 flattened on three mapped horizons, demonstrates that growth on the Emerald Prospect occurred predominantly during the Early Tertiary, post-Upper Cretaceous. This indicates the traps were developed prior to maturation of any potential source rocks in the Jurassic or Lower Cretaceous.

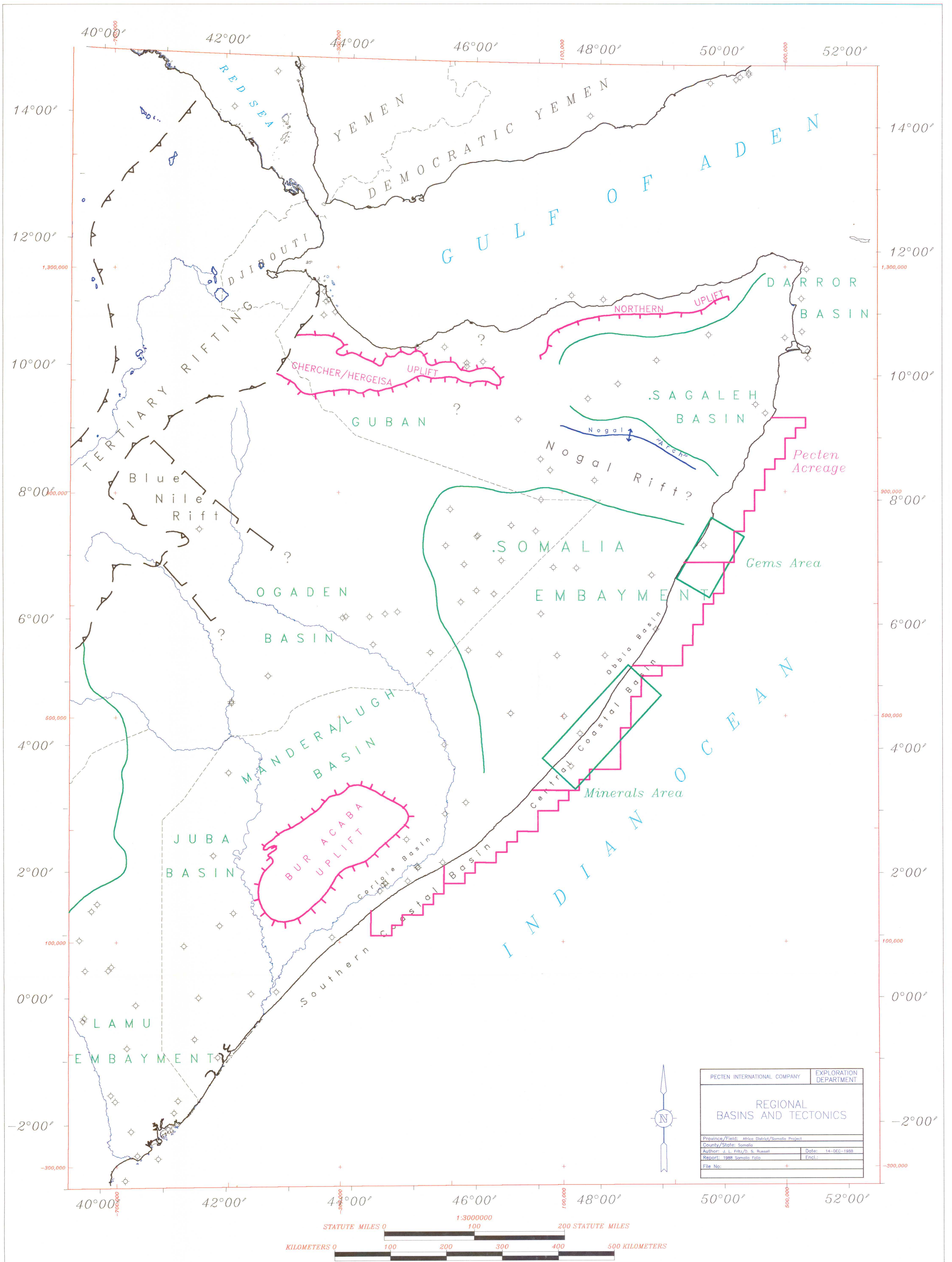
CONCLUSIONS

The 14.9 MM acres with these 5 offshore Exploration blocks should provide multiple play opportunities within the Mesozoic section. Both carbonate and clastic reservoir objectives are present and multiple stratigraphic horizons may provide source rock potential. The

Gem's area play provides the best opportunity at present, and provides excellent trapping configurations within the Upper Cretaceous carbonate section. This section exhibits good reservoir characteristics in the nearby Garad Mare well. An excellent sealing situation exists with 1450 meters of Tertiary shale capping the reservoir section. The numerous large and simple structures with excellent seals on the reservoir section provide a very large scope play with enormous volume potential. However, as is the case for all of the East African margin, source rock and charge remain the primary risk for successful plays along this passive margin.



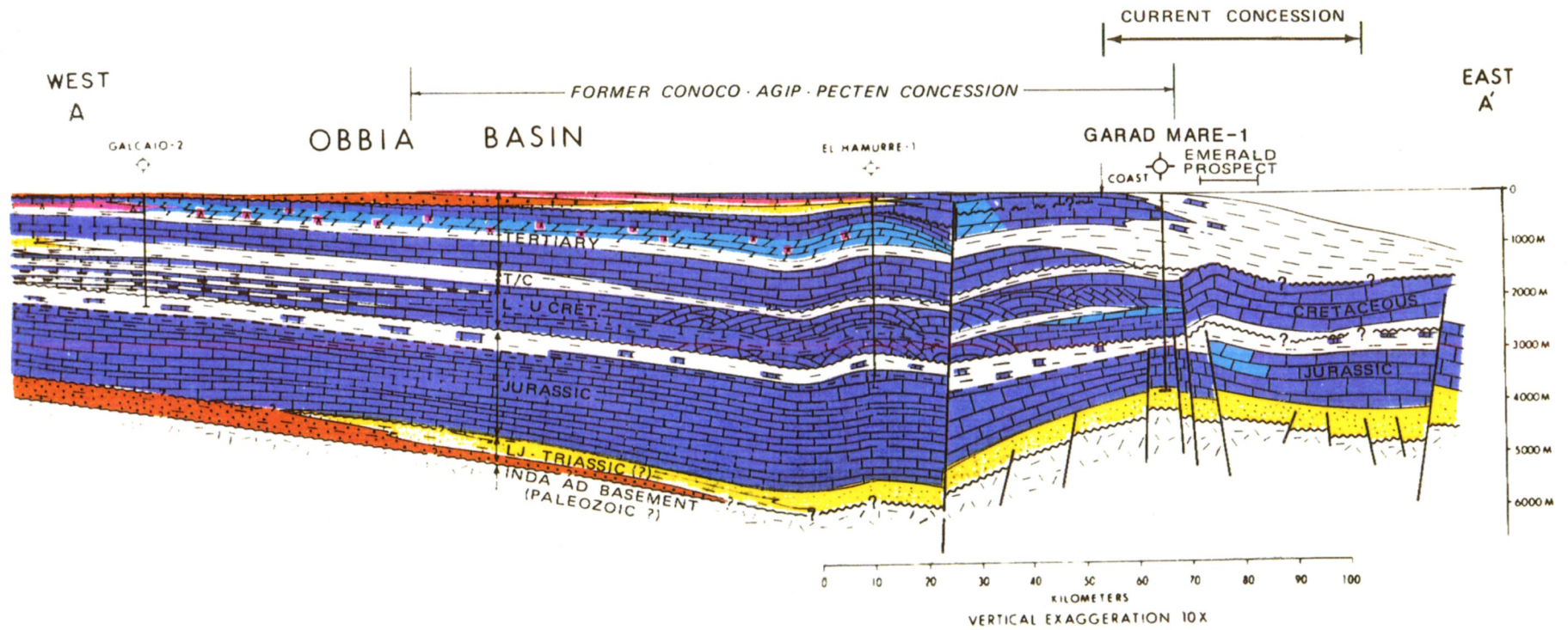
Figure



PECTEN INTERNATIONAL COMPANY		EXPLORATION DEPARTMENT	
REGIONAL BASINS AND TECTONICS			
Province/Field: Africa District/Somalia Project			
Country/State: Somalia			
Author: J. L. Fritz/D. S. Russell	Date: 14-DEC-1988		
Report: 1988 Somalia Fallo	Encl.:		
File No:			

Figure 2

PECTEN INTERNATIONAL-AFRICA DISTRICT
SOMALIA COASTAL BASINS
 REGIONAL GEOLOGIC CROSS-SECTION



STAFF '75,'88

Figure 3

SOMALIA EMBAYMENT GEOLOGIC DEVELOPMENT

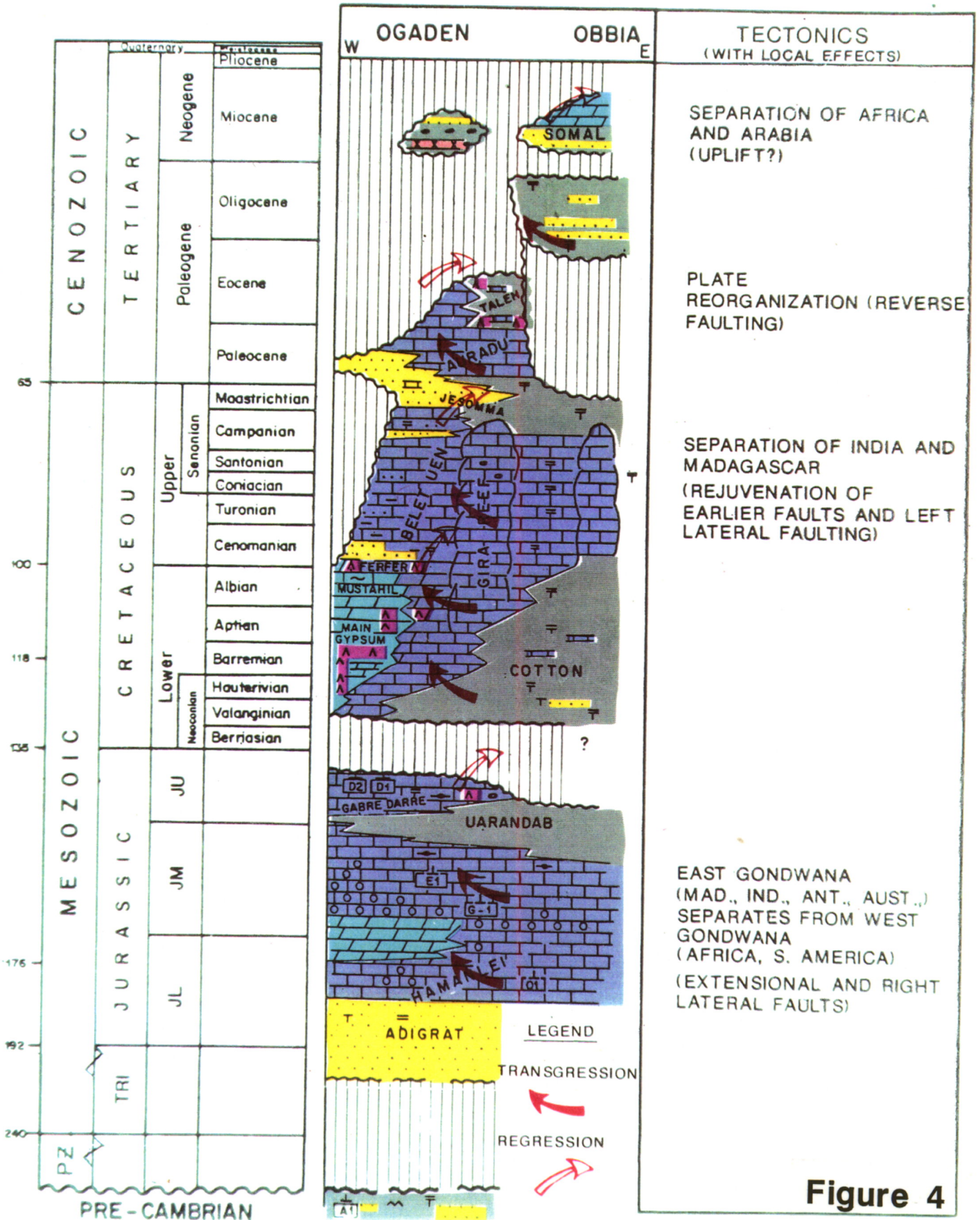


Figure 4

SOMALIA COASTAL BASINS

GENERALIZED STRATIGRAPHY

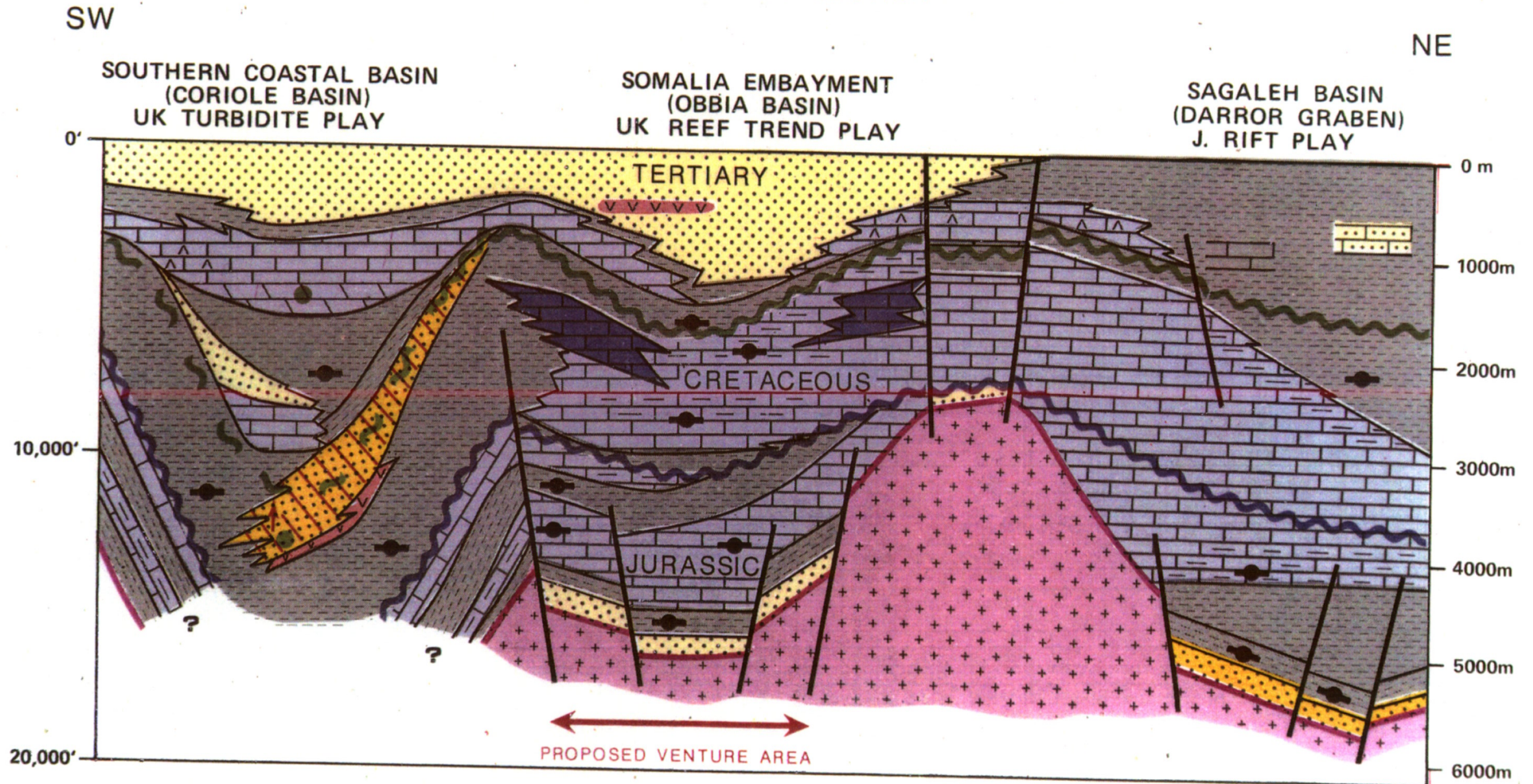
		AGE	MAXIMUM DEPTH (METERS)	LITHOLOGY	RESERVOIR	POTENTIAL SOURCE ROCK	SEAL
TERTIARY		MIOCENE		MERCA			
			850				
		OLIGOCENE		SOMAL			
			2000				
		UPPER EOCENE		KARKAR / OBBIA			
		MID. EOCENE	2850	TALEH / NOGAL	*	*	
	L. EOCENE - PALEOCENE	3150	AURADU / CORIOLE				
		3900	SAGALEH / MARAI ASCIA			*	
CRETACEOUS		PALEOCENE	4650	JESOMMA	*	*	
		UPPER	5050	BELET UEN / GIRA / GUMBURO	*	*	
			5975				
		LOWER	6275	FERFER / MUSTAHIL			*
		6450	MAIN GYPSUM / COTTON /		*		
JURASSIC		UPPER	7200	GABREDARRE	*		
			7850	UARANDAB		*	
			8600		*		
		MIDDLE	9800	HAMANLEI	*	*	
			11,050			*	*
TRI.	LOWER J. - TRIASSIC	11,650	ADIGRAT	*	*		
	LOWER PALEOZOIC ?	12,500	INDA AD (BASEMENT)				
	PRE - C						







Figure 5

PECTEN INTERNATIONAL - AFRICA DISTRICT

SOMALIA COASTAL BASINS

PLAY CONCEPTS
SCHEMATIC CROSS SECTION



-  TERTIARY / CRETACEOUS UNCONFORMITY
-  CRETACEOUS / JURASSIC UNCONFORMITY
-  BASE JURASSIC
-  SIGNIFICANT OIL SHOW
-  SIGNIFICANT GAS SHOW
-  POTENTIAL SOURCE ROCK

0 100 200 300 400 KM

VERTICAL EXAGGERATION: x130

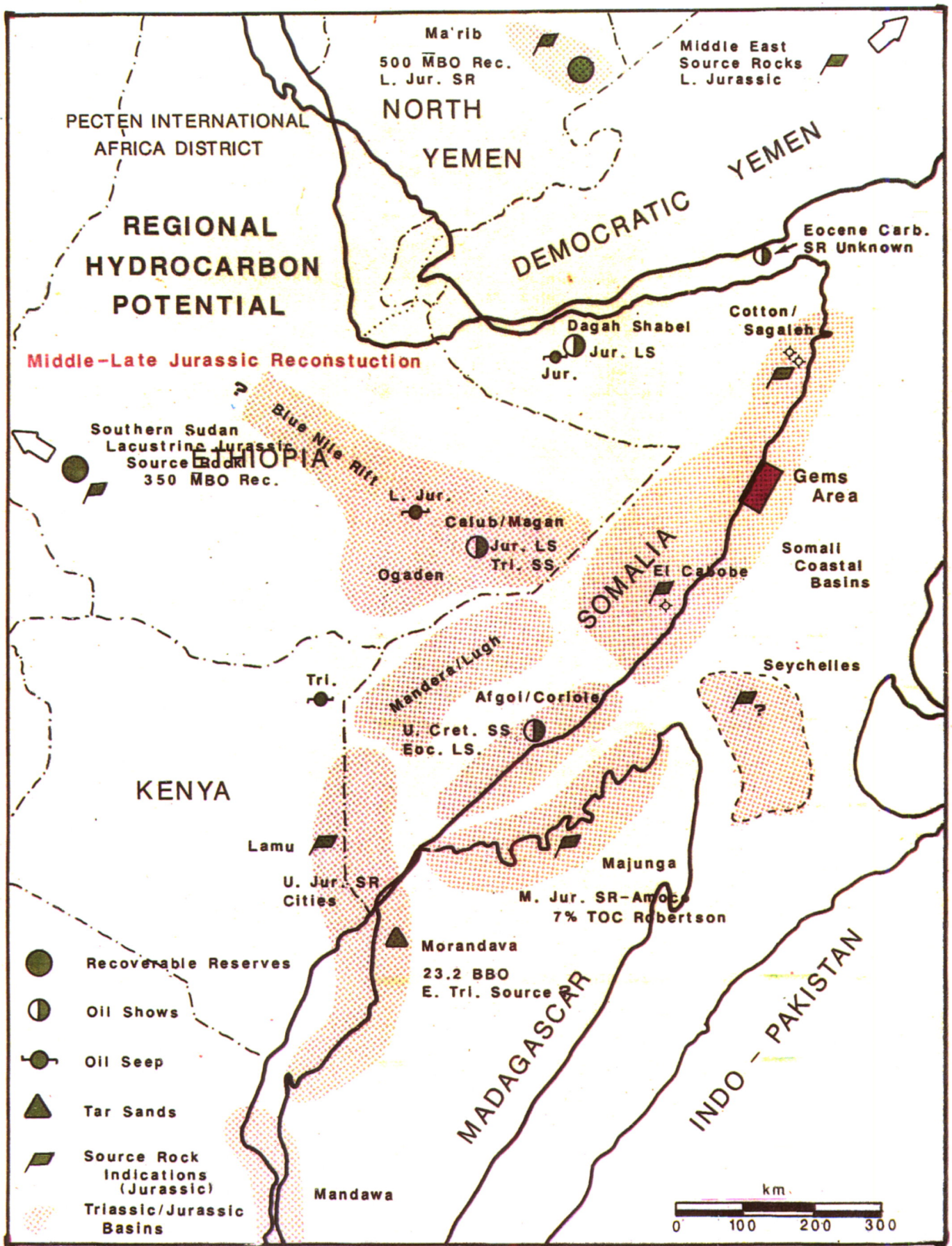


Figure 7

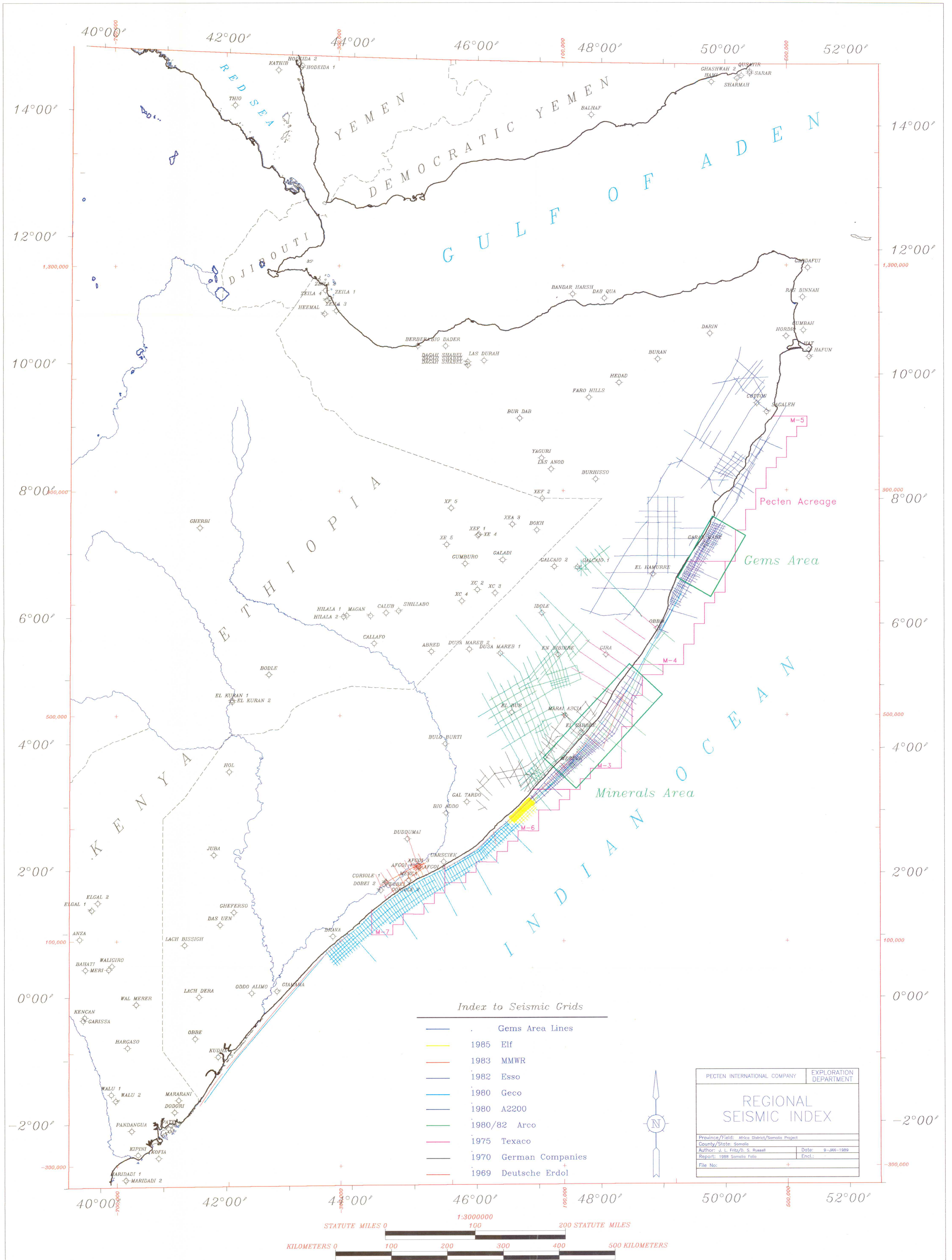


Figure 8

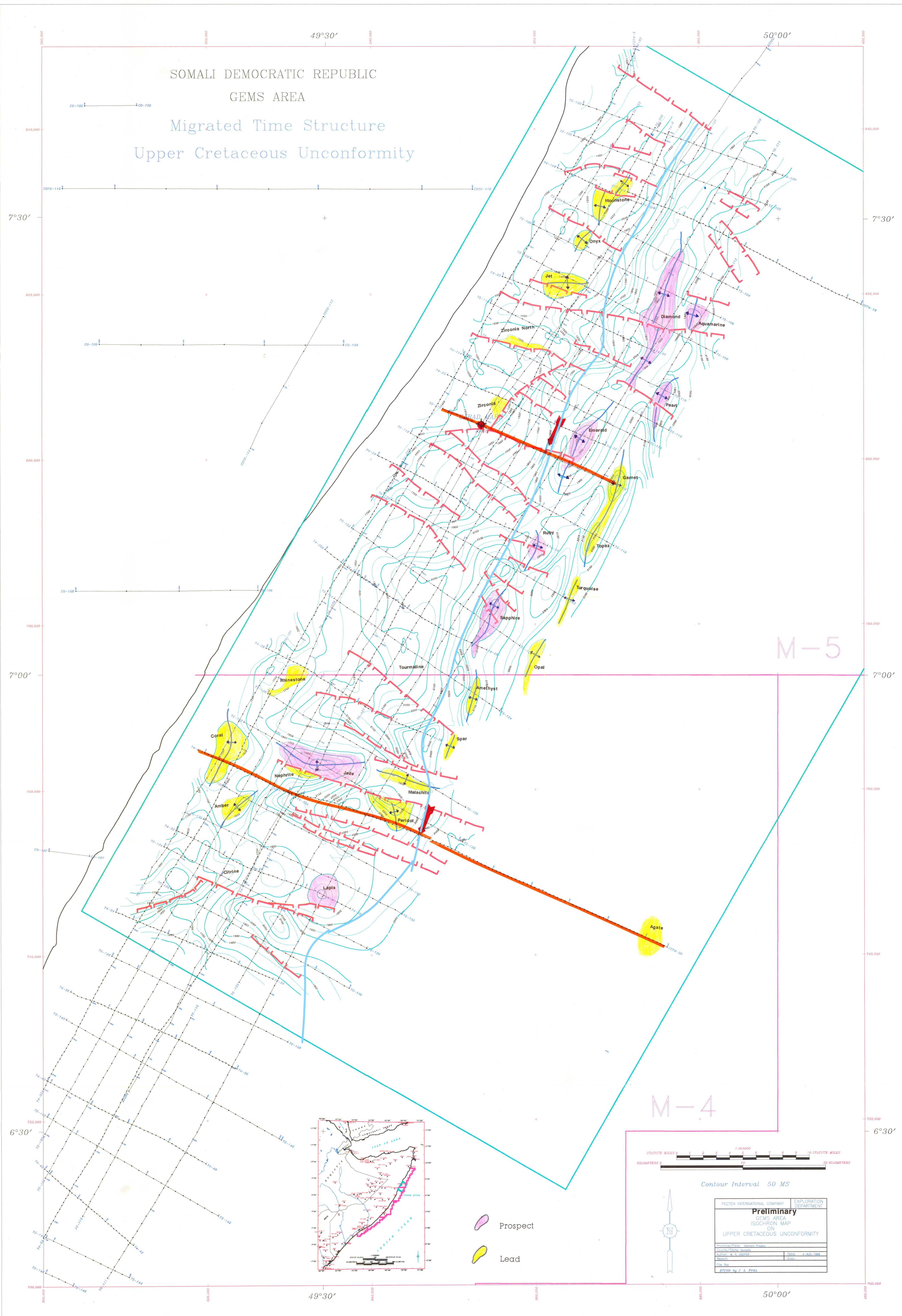
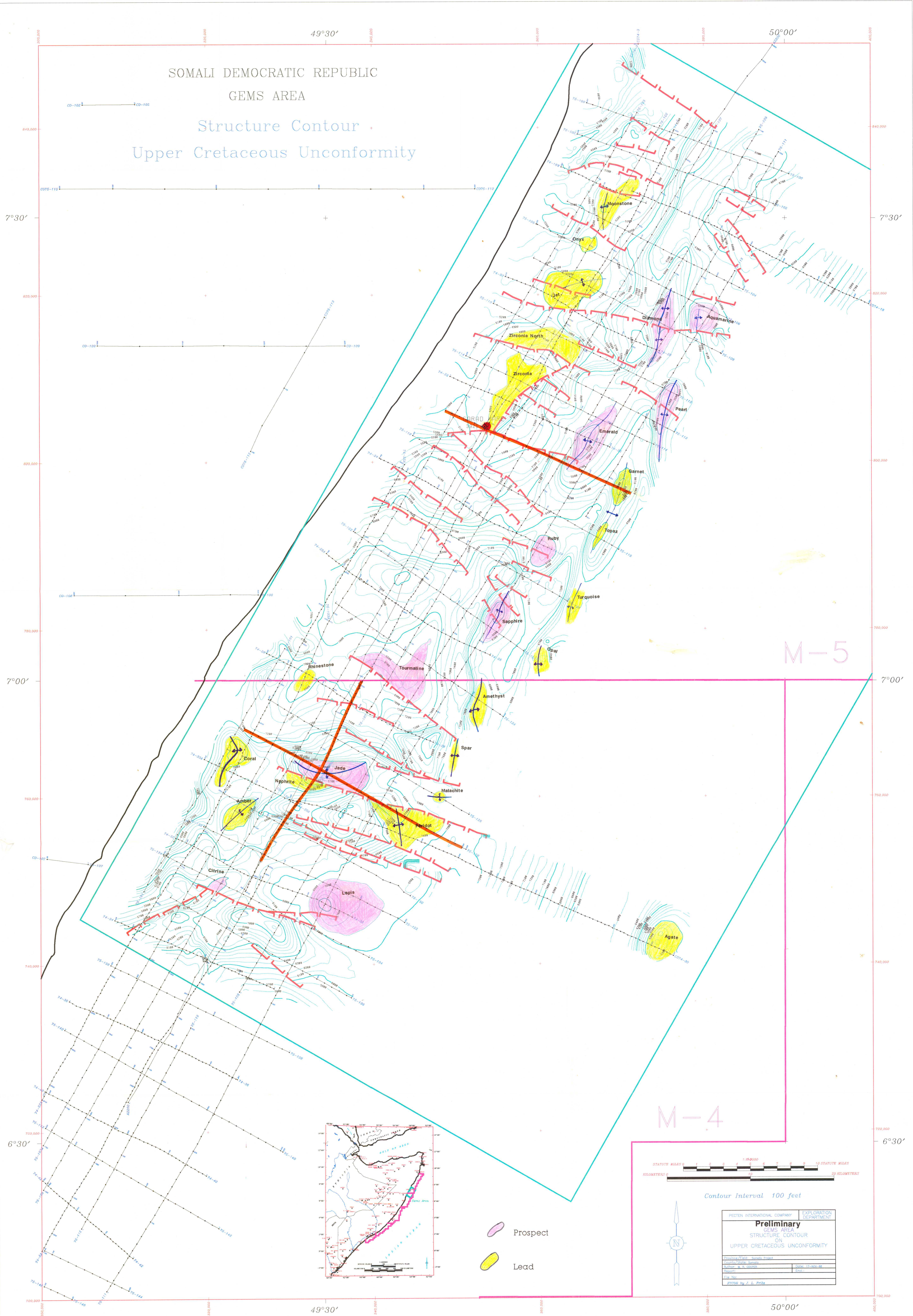


Figure 9

SOMALI DEMOCRATIC REPUBLIC
GEMS AREA

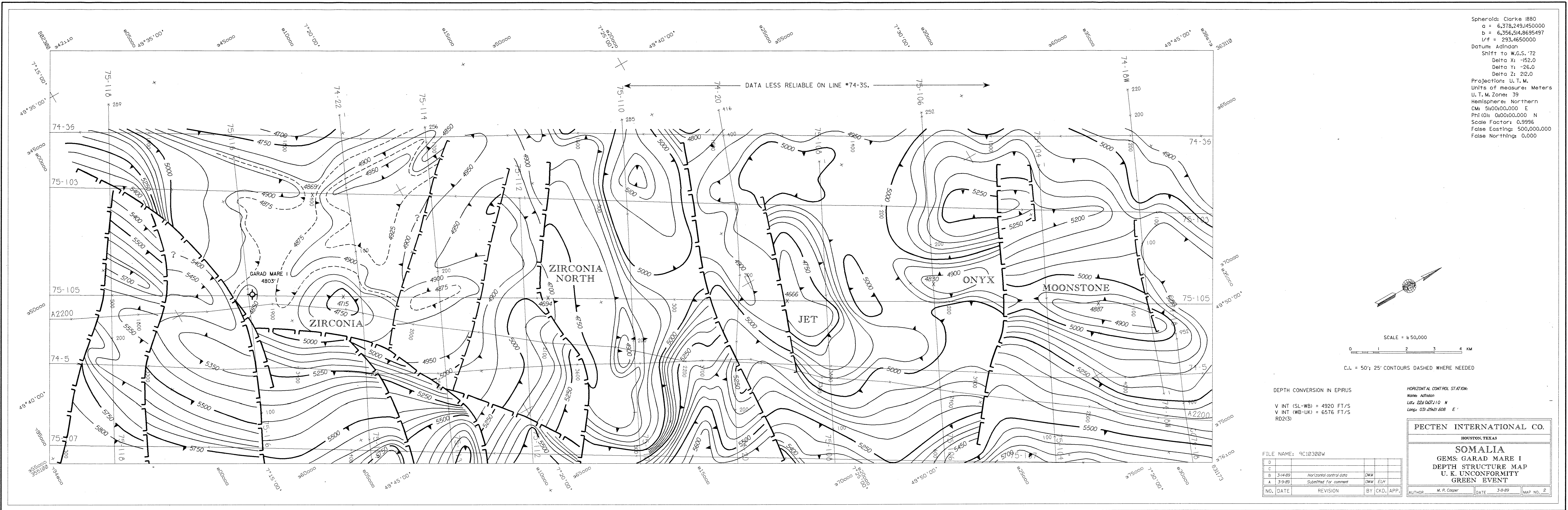
Structure Contour
Upper Cretaceous Unconformity



- Prospect
- Lead

PECTEN INTERNATIONAL COMPANY		EXPLORATION DEPARTMENT	
Preliminary			
GEMS AREA			
STRUCTURE CONTOUR			
ON			
UPPER CRETACEOUS UNCONFORMITY			
Project No.	11-00000	Date	11-00-00
Author	J. L. Price	Scale	1:150,000
Report No.		Page	1
Drawn by	J. L. Price		

Figure 10



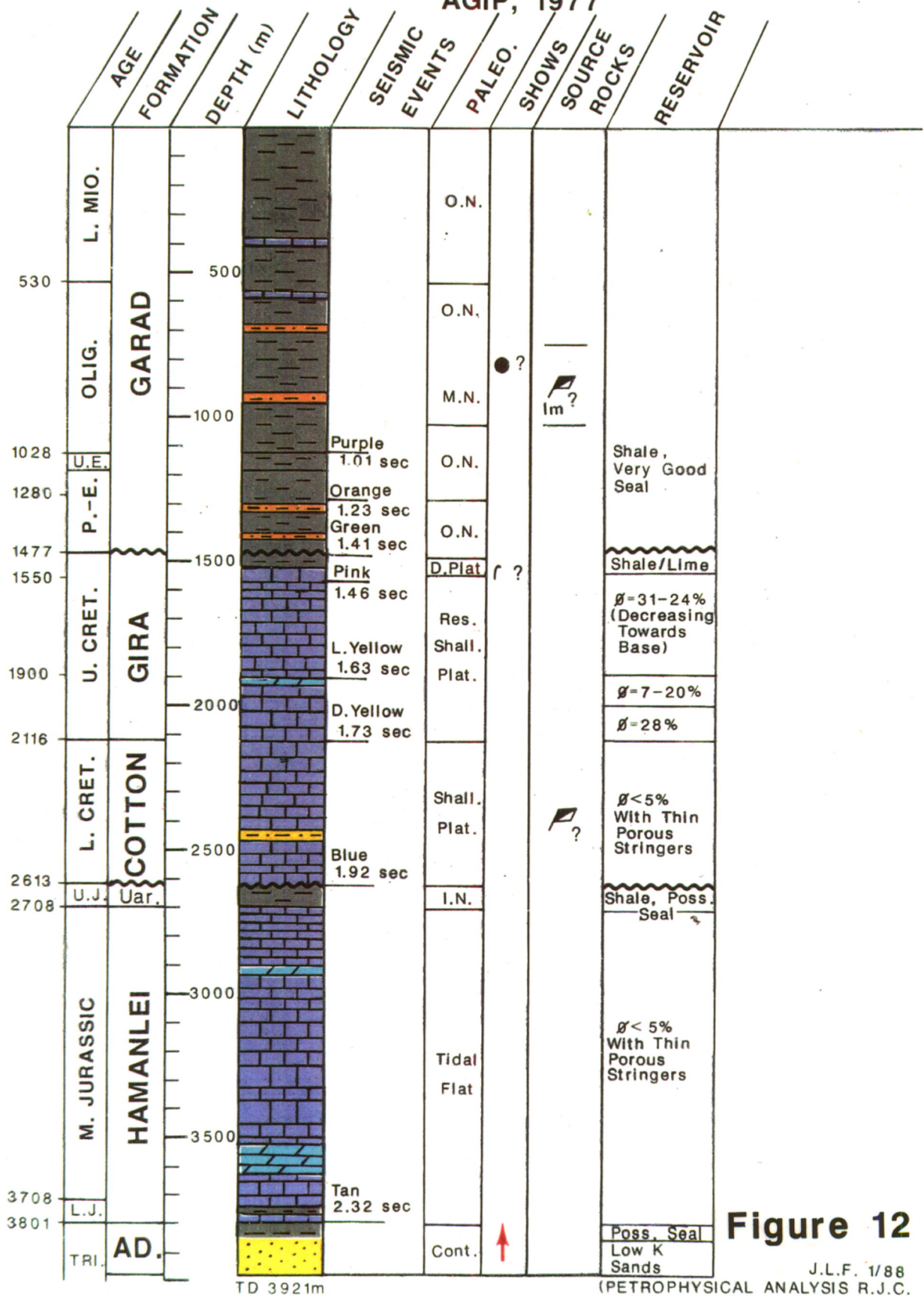
Spheroid: Clarke 1880
 a = 6,378,249.1450000
 b = 6,356,514.8695497
 1/f = 293.4650000
 Datum: Adindan
 Shift to W.G.S. '72
 Delta X: -152.0
 Delta Y: -26.0
 Delta Z: 212.0
 Projection: U. T. M.
 Units of measure: Meters
 U. T. M. Zone: 39
 Hemisphere: Northern
 CM: 5100:00.000 E
 Phi (0): 00:00:00.000 N
 Scale Factor: 0.9996
 False Easting: 500,000.000
 False Northing: 0.000

Figure 11

SOMALIA EMBAYMENT

GARAD MARE-1

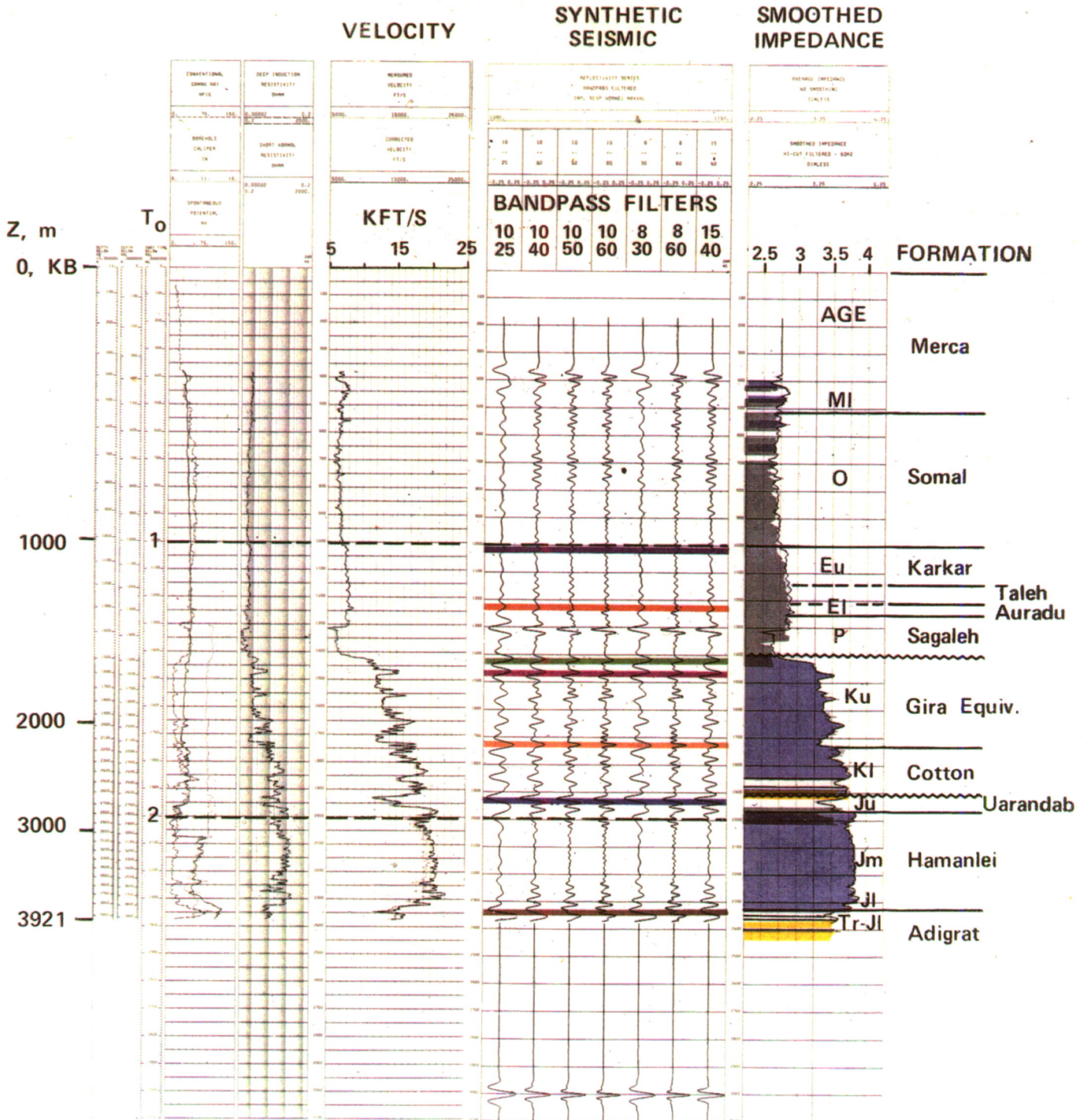
AGIP, 1977



TD 3921m

Figure 12
J.L.F. 1/88
(PETROPHYSICAL ANALYSIS R.J.C. 7/87)

PECTEN INTERNATIONAL – AFRICA DISTRICT
SOMALI EMBAYMENT
GARAD MARE 1



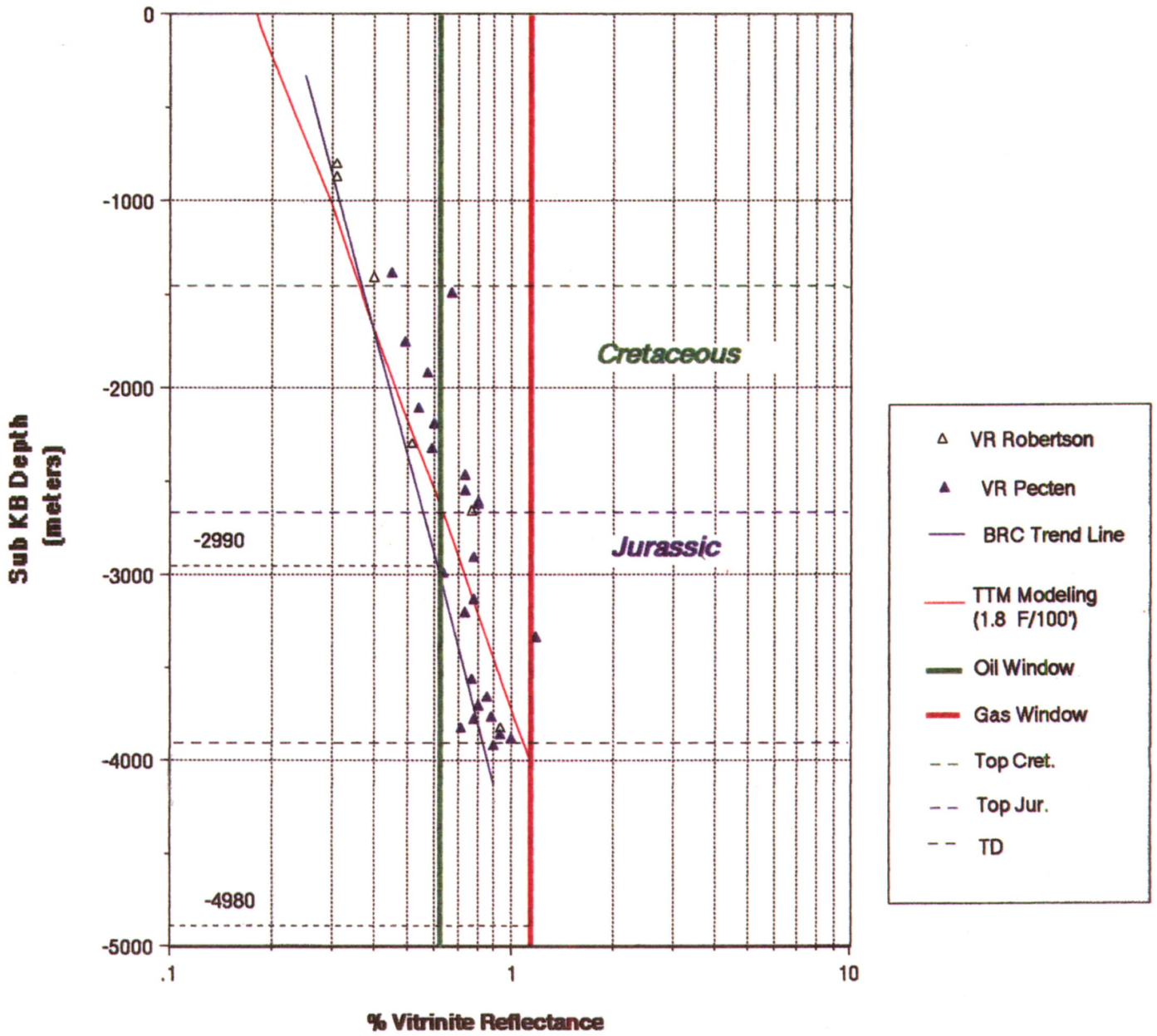
AF-S-8-306

Figure 13

Somalia Geochemistry Project - 1989

Garad Mare (Agip, 1977)

VR Maturity Profile



Pecten International - Africa District

(Data from Robertson Research)

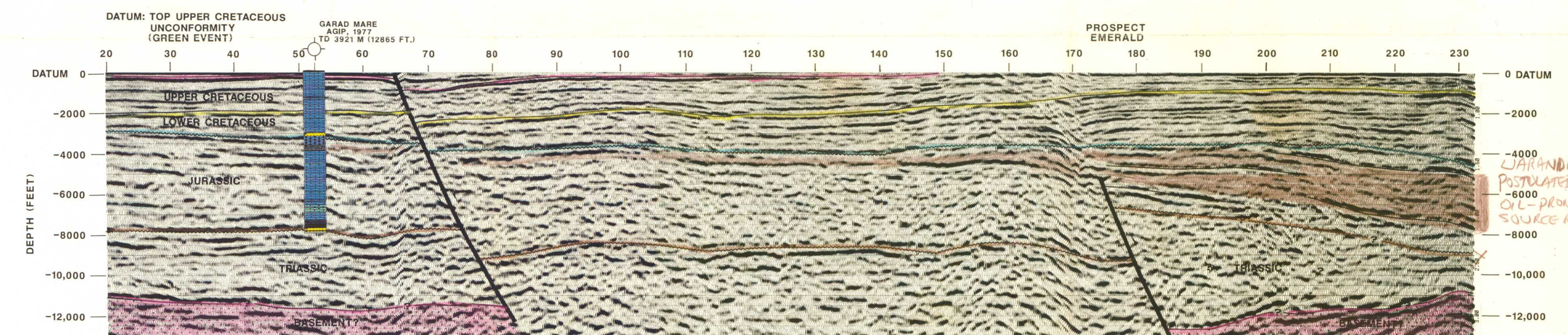
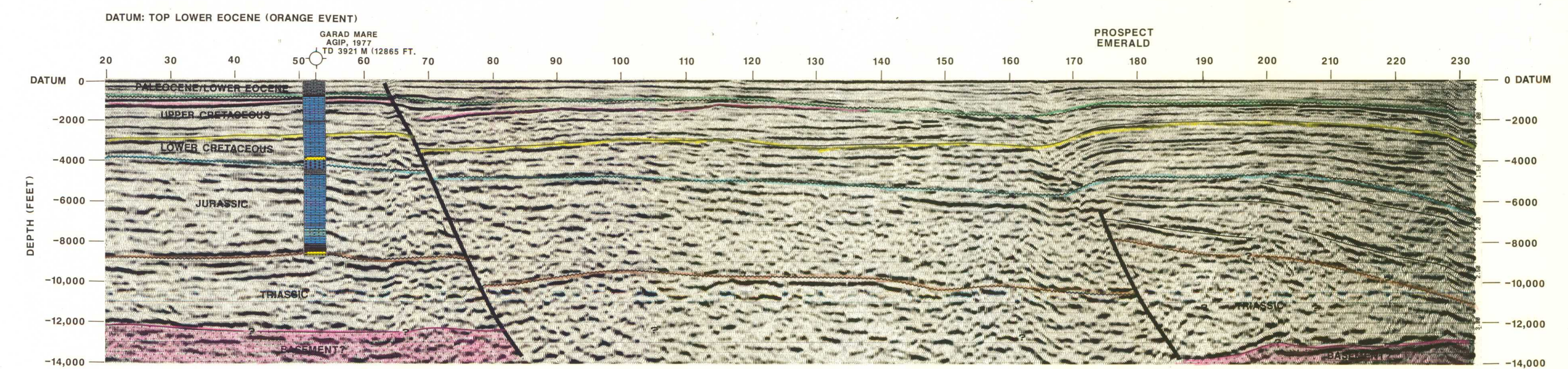
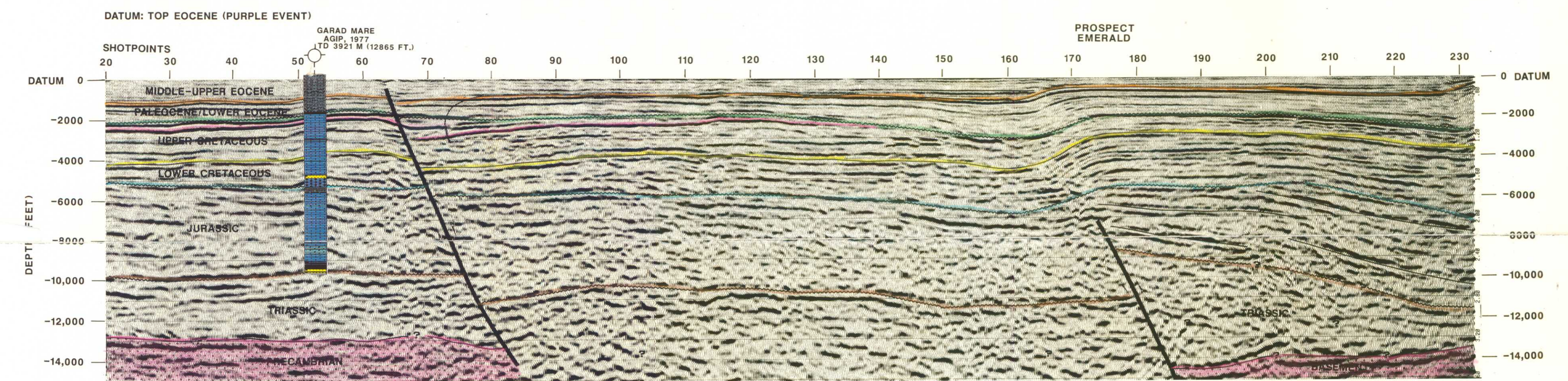
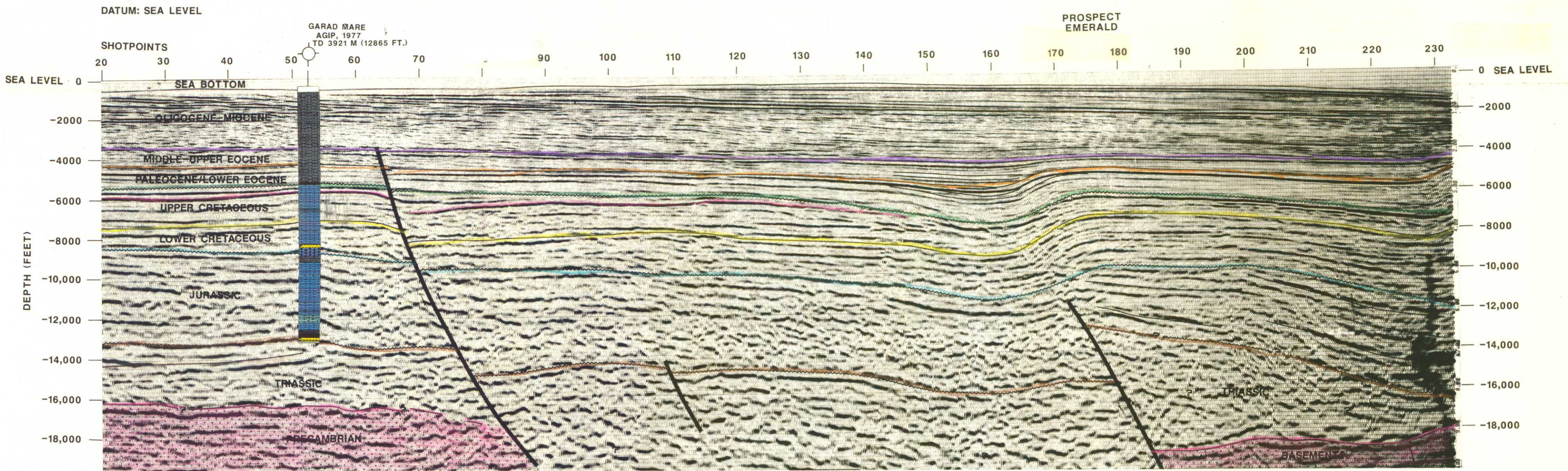
JLF/DSR
8/89

Figure 14

SEISMIC LINE 75-116 - FLATTENED IN DEPTH
OFFSHORE GEMS AREA - BLOCK M-5

NORTHWEST

SOUTHEAST



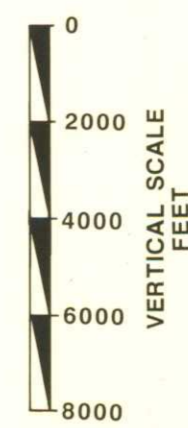
LIAKANDAB
POSTULATED
OIL-PROSE
SOURCE IF

CONCLUSIONS:

1. STRUCTURAL DEVELOPMENT ON PROSPECT EMERALD OCCURRED BETWEEN END UPPER CRETACEOUS AND END EOCENE
2. NO EVIDENCE FOR STRUCTURAL GROWTH DURING UPPER CRETACEOUS
3. GROWTH CEASED DURING EARLIEST OLIGOCENE

- (PURPLE) TOP U. EOCENE
- (ORANGE) PALEOCENE-L. EOCENE
- (GREEN) UPPER CRETACEOUS UNCONFORMITY
- (PINK) INTRA U. CRETACEOUS EVENT
- (YELLOW) TOP L. CRETACEOUS
- (BLUE) TOP U. JURASSIC
- (TAN) TOP TRIASSIC

NEGLECTIBLE VERTICAL EXAGGERATION



PECTEN SOMALIA
HOUSTON, TEXAS
AFRICA DISTRICT
SOMALIA PROJECT-1988
GEMS AREA
SEISMIC LINE 75-116
FLATTENED IN DEPTH
AUTHOR: M.R. COOPER & J.L. FRITZ DATE: 1/89 ENCL: _____

Figure 15

**SOMALIA
CONCESSION AGREEMENT
Summary of Terms**

Parties: Pecten Somalia Company
Ministry of Mineral and Water Resources

Area: 14,905,000 (60,344 Sq. Km.)
5 offshore blocks M-3 through M-7

Effective Date: November 1, 1988

Signature Bonus: \$500,000

Equipment Purchase: \$220,000 (deferred)

Exploration Term and Minimum Work and Expenditure Commitments: Initial period 3 yrs - One Well, 1500 km. seismic
\$6.8 MM
Fourth Contract Year - 1 Well - \$5.5MM
Fifth Contract Year - 1 Well - \$5.5MM
Sixth Contract Year - 1 Well - \$5.5MM

Production Term: 25 years

Royalty: 15% Oil
12.5% Gas

Income Tax: 35%

Supplemental Income Tax:

<u>RROR</u>	<u>Tax Rate</u>
< 15%	0%
15-24%	35%
24-30%	60%
> 30%	75%

Annual Rentals: \$61,350/yr.

Training Commitment: \$75,000/yr. (exploration phase)
\$250,00/yr. (production)

WCS/la
10/25/88

Pecten Somalia Proposal

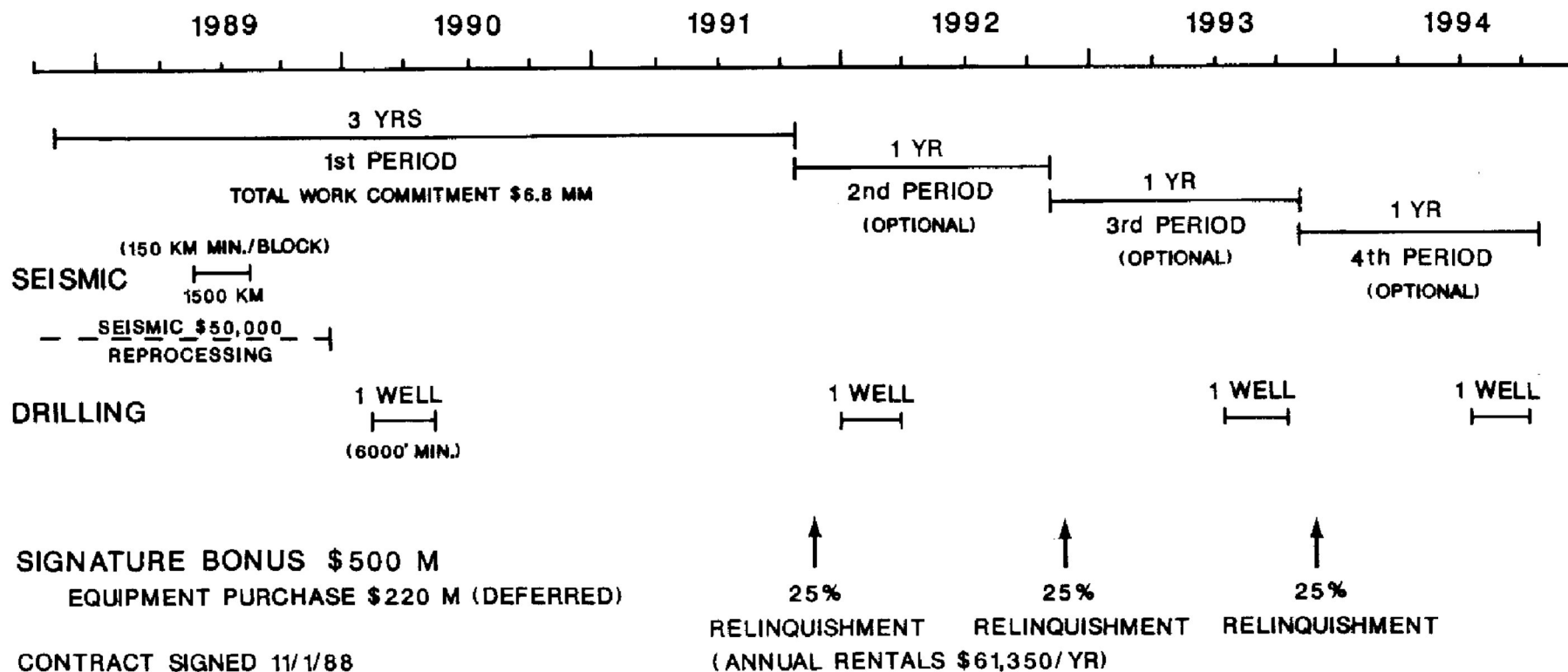
PECTEN INTERNATIONAL - AFRICA DISTRICT

SOMALIA

CONTRACT TERMS

5 OFFSHORE BLOCKS - 14.9 MM ACRES

(BLOCKS: M-3, M-4, M-5, M-6, M-7)



TRAINING	ROYALTY	SUPPLEMENTAL TAX *	
		REAL RATE OF RETURN	TAX RATE
EXPLORATION PHASE - \$75,000/YR	15% OIL	<15%	0
PRODUCTION PHASE - \$250,000/YR	12 1/2 % GAS	15-24%	35%
		24-30%	60%
		>30%	75%

* SUPPLEMENTAL TAX RATE IN ADDITION TO BASE TAX EQUAL TO 35% OF NET PROFITS.