

## TABLE OF CONTENTS

	<u>Page</u>
Executive Summary	ii
Table of Contents	vii
List of Figures and Tables	viii
Acknowledgments	x
<b>SECTION A. SERGIPE-ALAGOAS BASIN GEOLOGY</b>	
Introduction	A-1
Tectonic and Stratigraphic Evolution	A-5
Source Rocks	A-6
Timing of Generation and Migration	A-7
Reservoirs	A-7
Oil Chemistry	A-9
Exploration Significance	A-14
<b>SECTION B. PETROLEUM GEOCHEMISTRY AND CORRELATION</b>	
Introduction	B-1
Crude Oil Quality	B-4
Whole Oil Gas Chromatography	B-9
Stable Carbon Isotopic Compositions	B-13
Biomarker Distributions	B-18
GC/MS Results	B-18
GC/MS-MS Results	B-26
Thermal Maturity	B-26
Multivariate Statistical Analysis	B-29
Summary	B-37
<b>C. REFERENCES/BIBLIOGRAPHY</b>	C-1
<b>D. APPENDICES</b>	
A. Experimental Procedures	D-1
B. Physical Properties	D-3
C. Biomarker Peak Identifications	D-4
D. Key Ratios for MRM-GC-MS Data for Selected Samples	D-5
E. Geochemical Summary Sheets	D-6

## LIST OF FIGURES AND TABLES

	<u>Page</u>
<b>SECTION A. SERGIPE-ALAGOAS BASIN GEOLOGY</b>	
A1. Location Map of the Sergipe-Alagoas Basin	A-1
A2. Stratigraphic chart of the Sergipe sub-basin	A-2
A3. Stratigraphic chart of the Alagoas sub-basin	A-3
A4. Paleogeographic map of the early-rifted South Atlantic margin	A-4
A5. Schematic dip cross-sections through the Sergipe-Alagoas Basin	A-5
A6. Geochemical log showing thick source rocks	A-7
A7. Location of active Ibura Member source rock	A-8
A8. Events chart of the Ibura-Muribeca (!) Petroleum System	A-8
A9. Cluster analysis dendrogram for Sergipe-Alagoas Basin oils	A-10
A10. Oil family distribution map for the Sergipe-Alagoas Basin	A-11
A11. Cross-section through the Carmopolis Field, onshore Sergipe	A15
A12. Regional geoseismic section from onshore towards the platform of the Sergipe sub-basin	A16
A13. Segments of regional deep seismic profiles from the Sergipe-Alagoas Basin	A17
<b>SECTION B. PETROLEUM GEOCHEMISTRY AND CORRELATION</b>	
B1. Crude oil location map: Sergipe-Alagoas Basin	B-1
B2a. Hydrocarbon/nonhydrocarbon versus API gravity	B-4
B2b. API gravity versus depth	B-7
B3. Aromatic/Saturate ratio versus weight percent sulfur	B-8
B4. Representative Whole oil gas chromatograms	B-10
B5. Average normalized n-paraffin distributions	B-11
B6a. Pristane/phytane versus pristane/n-C <sub>17</sub>	B-12
B6b. Isoprenoid ratios	B-13
B7. Stable carbon isotopic compositions	B-14
B8. Pristane/phytane ratio versus canonical variable	B-15
B9. Cluster analysis dendrogram	B-16
B10. Principal component loadings and scores plots	B-17
B11a. Representative Terpane (m/z 191) mass chromatograms	B-22
B11b. Representative Sterane (m/z 217) mass chromatograms	B-23
B12. Diagnostic tricyclic terpane biomarker ratios	B-24
B13. Sterane/Hopane versus C <sub>30</sub> Tetracyclic Terpane/C <sub>27</sub> diasteranes	B-24
B14. αββ Sterane (m/z 218) compositions	B-25
B15. Diagnostic terpane biomarker ratios	B-25
B16. C <sub>27</sub> Ts/Tm versus diasterane index: Maturity parameters	B-27
B17. C <sub>29</sub> Sterane biomarker maturity parameters	B-28
B18. Cluster analysis dendrogram for Sergipe-Alagoas Basin oils	B-30
B19a. Principal component loadings plot	B-31
B19b. Principal component scores plot	B-31
B20. Oil family distribution map for the Sergipe-Alagoas Basin	B-32

**LIST OF FIGURES AND TABLES**

	<u>Page</u>
<b>TABLES</b>	
<b>SECTION A. SERGIPE-ALAGOAS Basin</b>	
A1. Oil Families in the Sergipe-Alagoas Basin	A-9
<b>SECTION B. PETROLEUM GEOCHEMISTRY AND CORRELATION</b>	
B1. Sergipe-Alagoas Crude Oil Location Information.	B-2
B2. Brazilian Oil Gross Compositional Data.	B-5
B3. Geochemical Parameters used in the Statistical Evaluation of the Sergipe-Alagoas Oils.	B-20
B4. Sergipe-Alagoas Crude Oil Families	B-36