

PREVIEWS

Reducing risk in subsalt resources	<i>This new approach to calculating and restoring the effects of physical compaction in subsalt units will improve the accuracy of sequential restoration of subsalt hydrocarbon plays, allowing their structural configurations through time to be more accurately quantified.</i>	1385
Oil source correlation	<i>Organic facies of the Eocene lacustrine Liushagang Formation, South China Sea, are either algal-dominated or of terrestrial algal origin. Oil groups A and B are end members that correspond to the algal-dominated facies, and Group C oils are a mixture of groups A and B.</i>	1395
A novel technology	<i>Three-dimensional printing technology provides a novel, alternative method for laboratory testing of digital rock models made from scanning natural rock samples. While many 3-D printers are currently unable to reproduce pore networks at their original scale, this problem should improve in the future. . . .</i>	1425
Understanding a prolific producer	<i>Detailed examination of 10 distinct source beds in the Red River Formation, Williston Basin, North Dakota, will determine whether hydrocarbon generation from them can account for basin-wide Red River hydrocarbon production. It will also help guide future exploration.</i>	1445
Managing risk	<i>Event-based risk management provides a framework in which the key subsurface risks that could affect the value of oil and gas projects or assets can be identified systematically. After identification, they can be managed with the objective of improving business performance.</i>	1473
Clinoforms and the Barents Sea	<i>In the study area, southwestern Barents Sea, seven sequences and three clinoform scales are recognized. This paper contributes to a better understanding of the variables that increase the bypass of coarse-grained sediments to deep water settings.</i>	1487
Eolian sandstone and transport direction	<i>Determining the source areas and paleotransport direction of the eolian sand of the Upper Jurassic Norphlet Formation can improve predictions of the distribution of the dune facies around the Gulf of Mexico. Wadis and alluvial fans were the primary route for introducing sediment.</i>	1519
Lacustrine source rock origins	<i>In the Zhu 1 depression, South China Sea, the Wenchang and Enping Formations are potential source rocks. Both have wide variations in quality and quantity of organic matter due to the nature of biological precursors and depositional environments.</i>	1543

AAPG BULLETIN STAFF

Editorial

Technical Publications Assistant Team Lead/Paula Sillman
Technical Editor/Andrea Sharrer
Phone: (918) 584-2555
(800) 364-2274 (U.S. and Canada)
Fax: (918) 560-2632
E-mail: bulletin@aapg.org

Production

Cover/Matt Randolph
Production/Sheridan Journal Services
Waterbury, Vermont
Printing/Sheridan - Sheridan PA
Hanover, Pennsylvania

Subscriptions

Members	Nonmembers
Membership Dept.	Accounting Dept.
Phone: (918) 584-2555	(918) 584-2555
Fax: (918) 560-2694	(918) 560-2652
Toll Free: (800) 364-2274	bulletinsubscriptions@aapg.org (U.S. and Canada)

AAPG grants permission for a single photocopy of an item from the AAPG Bulletin for personal use. Authorization for additional photocopies of items from the AAPG Bulletin in any form (hardcopy, digital/electronic scanning, or other digital transformation into computer-readable and/or transmittable form) for personal or corporate use is granted provided the appropriate fee is paid directly to the Copyright Clearance Center, 222 Rosewood Drive, Danvers, Massachusetts 01923, <http://www.copyright.com>. For circumstances occurring outside authorization of Copyright Clearance Center contact permissions@aacg.org.

The AAPG Bulletin (ISSN 0149-1423) is published monthly by the American Association of Petroleum Geologists. Offices are located at 1444 South Boulder Avenue, Tulsa, Oklahoma 74119-3604. Periodicals postage paid at Tulsa, Oklahoma, and at additional mailing offices.

POSTMASTER: send change of address to AAPG Bulletin, P.O. Box 979, Tulsa, Oklahoma 74101-0979.

SUBSCRIPTIONS

Institutional subscriptions are \$540 U.S. by surface mail; \$700 non-U.S. by Airmail. AAPG member subscriptions are included in the dues. Single copies: \$35 member, \$45 nonmember. Prices subject to change without notice. Claims for nonreceipt of any issue, if reported within three months of the date of publication, will be filled gratis. Back issues, if available, may be ordered from the Association.

Copyright © 2017 by the American Association of Petroleum Geologists. All rights reserved. Phone (918) 584-2555, fax (918) 560-2632, e-mail: bulletin@aapg.org

CANADA SUBSCRIPTIONS

Canada Post Agreement Number 40036158. Send change of address information and blocks of undeliverable copies to P.O. Box 1051, Fort Erie, ON, L2A 6C7, Canada.

The American Association of Petroleum Geologists (AAPG) does not endorse or recommend any products or services that may be cited, used or discussed in AAPG publications or in presentations at events associated with AAPG.



AAPG Editor
BARRY JAY KATZ
Chevron Energy Technology Company
Houston, Texas

SENIOR ASSOCIATE EDITORS

Kent Bowker, Bowker Petroleum, The Woodlands, TX
Caroline M. Burberry, University of Nebraska-Lincoln, Lincoln, NE
Richard Groshong, University of Alabama, Tuscaloosa, AL
Colin P. North, University of Aberdeen, Aberdeen, Scotland
Stephen Ruppel, Bureau of Economic Geology, The University of Texas at Austin, Austin, TX

ASSOCIATE EDITORS

Spatial

Bret J. Fossum, ConocoPhillips, Houston, TX

2016-2017

Patricia F. Allwardt, ConocoPhillips, Houston, TX
Janok P. Bhattacharya, McMaster University, Hamilton, ON, Canada
Brigitte Doligez, Institut Francais du Petrole, Cedex, France
Julia F. W. Gale, University of Texas at Austin, Austin, TX
Chenglin Gong, University of Texas at Austin, Austin, TX
Fang Hao, China University of Petroleum, Beijing, China
Nicholas B. Harris, University of Alberta, Edmonton, AB, Canada
Qinhong Hu, University of Texas at Arlington, Arlington, TX
Dale A. Leckie, Nexen Inc., Calgary, AB, Canada
Terrilyn Olson, FEI, Denver, CO
Bradford E. Prather, Shell Upstream Americas, Houston, TX

2017-2018

Mohammed S. Ameen, Saudi Aramco, Dhahran, Saudi Arabia
Donna S. Anderson, EOG Resources Inc., Golden, CO
Claudio Bartolini, Repsol, The Woodlands, TX
Arthur E. Berman, Sugar Land, TX
William Craddock, USGS, Reston, VA
Stephen P. Cumella, Consulting Geologist, Denver, CO
William D. DeMis, Goldman Sachs, Houston, TX
Thomas L. Dunn, Chevron, Houston, TX
Melanie Everett, Chevron Energy Technology Company, Houston, TX
Ursula Hammes, Bureau of Economic Geology, The University of Texas at Austin, Austin, TX
Stuart D. Harker, Aberdeen, Scotland
William A. Hill, BP, Houston, TX
Alexander A. Kitchka, Centre for Aerospace Research of the Earth at Institute of Geological Sciences (CASRE), Kiev, Ukraine
Andres Mora, Instituto Colombiano del Petróleo-ICP, Colombia
Joyce E. Neilson, University of Aberdeen, Aberdeen, Scotland
Kenneth E. Peters, Schlumberger and Stanford University, Mill Valley, CA
Dave A. Pivnik, Apex International Energy, Houston, TX
Sandro Serra, Serra GeoConsulting LLC, Bellaire, TX
Carl K. Steffensen, BP America Inc., Houston, TX
Peter D. Warwick, U.S. Geological Survey, Reston, VA

The American Association of Petroleum Geologists

EXECUTIVE COMMITTEE 2017–2018

President: CHARLES STERNBACH
Sections Vice President: DANIEL E. SCHWARTZ
Regions Vice President: DAVID R. COOK
President-Elect: DENISE COX
Secretary: LAURA JOHNSON
Treasurer: MARTIN HEWITT
Editor: BARRY KATZ
Chair, House of Delegates: DAVID ENTZMINGER

ADVISORY COUNCIL, 2017–2018

Ex-Officio

PAUL BRITT, Chair
JOHN R. HOGG
RANDI MARTINSEN
DOUGLAS E. WYATT, JR.
STEPHEN TESTA
JAMES M. HILL
JIM MCGHAY

Elected

CRAIG ECKERT, Eastern Section
DEBORAH SACREY, Gulf Coast Section
WILLIAM "BILL" WHITING, Gulf Coast Section
JOEL A. ALBERTS, Mid-Continent Section
STEPHEN A. "TONY" REID, Pacific Section
JOHN C. LORENZ, Rocky Mountain Section
JOSEPH R. DAVIS, Southwest Section
NOSA OMORODION, Africa Region
MARK TINGAY, Asia Pacific Region
RYAN LEMISKI, Canada Region
ANDREA MOSCARIELLO, Europe Region
VICTOR H. VEGA, Latin America and Caribbean Region
SALIM AL-MAHROUQI, Middle East Region

AAPG BOARDS

JAMES PAINTER, Corporate Advisory Board
BRET J. FOSSUM, Datapages Board
JEFFREY W. LUND, IP LLC Board

AAPG COMMITTEE CHAIRS

BOB COUNTRYMAN, Association Group Insurance
DOUG COOK, Astrogeology
MARTIN HEWITT, Audit
MARTIN HEWITT, Budget Review & Finance
JANOK BHATTACHARYA, Distinguished Lecture
(Co-Chair)
KITTY MILLIKEN, Distinguished Lecture (Co-Chair)
LORI SUMMA, Education
MIKE UNGER, Education Awards
VAUGHN THOMPSON, Ethics
KEVIN BOHACS, Field Safety
HUYEN BUI, Geophysical Integration
JIM MCGHAY, GeVO (Co-Chair)
PINAR YILMAZ, GeVO (Co-Chair)
SHUHAB KHAN, GIS Publication
ROGERS HARDY, History of Petroleum Geology
KRISTEN WOODEN, Imperial Barrel
JOHN BROCK, Investment
JESSIE HOLLAND, Membership Career Services

WILLIAM HARRISON III, Preservation of Geoscience Data

ART BROWNING, Publications Pipeline
NATASHA RIGG, Public Outreach and Youth Education
DAVID BLANCHARD, Regions (Co-Chair)
VICTOR VEGA, Regions (Co-Chair)
JEAN-YVES CHATELLIER, Research (Co-Chair)
JOHN SUTER, Research (Co-Chair)
SOCHI IWUOHA, Reservoir Development
BILL HASKETT, Resource Evaluation
DALLAS DUNLAP, Sections
SCOTT W. DOUGLAS, Student Chapters (Co-Chair)
JAYNE "ALI" SLOAN, Student Chapters (Co-Chair)
FERNANDO ZIEGLER, Student Expo

SPECIAL INTEREST GROUPS (SIGS)

ROBYNN DICKS, Young Professional (Co-Chair)
RYAN LEMISKI, Young Professional (Co-Chair)
TERRA GEORGE, Professional Women in Earth Sciences (Chair)
ROBBIE GRIES, Visiting Geoscientist Program (Co-Chair)
PIOTR KRZYWIEC, Visiting Geoscientist Program (Co-Chair)

TECHNICAL INTEREST GROUP (TIG)

SOCHI MUOHA, Reservoir Development (Chair)

AAPG SECTION OFFICERS

Eastern Section

PATRICK GOODING, President
ANDREW WAGGENER, Vice President
SCOTT GORHAM, Secretary
BRIAN PANETTA, Treasurer
JOHN HICKMAN, Past President

Gulf Coast Section (GCAGS)

THOMAS EWING, President
RALPH RICHARDSON, Vice President
GENE AMES, III, 2017 GCAGS Convention General Chairman
DANIEL SUTTON, Treasurer
BRENT HOPKINS, Past President

Mid-Continent Section

H. W. PEACE, II, President
DOUG DAVIS, JR., Vice President
TERRY HOLLRAH, Secretary
MICHAEL ALLISON, Treasurer
DONALD G. BURDICK, Past President

Pacific Section

MIKE NELSON, President
MIKE CLARK, Vice President
RICK BEHL, President-Elect
TIM GROSS, Secretary
SIMMIE CHEHAL, Treasurer
LISA ALPERT, Treasurer-Elect
VAUGHN THOMPSON, Editor-in-Chief
ROBERT A. HORTON, JR., Past President

Rocky Mountain Section

JULIA LEMASTER, President
LYNETTE GEORGE, President-Elect
HEIDI SCHOENSTEIN, Secretary-Treasurer
PETER BUCKNAM, Secretary-Treasurer-Elect
ANDREW M. HENNES, Past President

Southwest Section

NICOLAS O. BRISSETTE, President
TERENCE "TERRY" O'HARE, President-Elect
PAUL PAUSE, Vice President
ROBERT SPRINGER, Secretary
KELLI SNIDOW, Treasurer
MICHAEL A. RAINES, Past President

AAPG REGION OFFICERS

Africa Region

WILLIAM BOSWORTH, President
SCOTT DUROCHER, Vice President
ADEGBENDGA "FEMI" ESAM, President-Elect
MIMONITU OPUWARI, Secretary
AJIBOLA OYEBAMIJI, Treasurer
DAVID BLANCHARD, Past President

Asia Pacific Region

MICHAEL "MICK" MCWALTER, President
MARK TINGAY, Vice President
JONATHAN CONTI, Secretary
ANDRE COFFA, Treasurer
PETER GRANT, Past President

Canada Region

MAREN L. BLAIR, President
ANNE C. HARGREAVES, Vice President/Treasurer
PETER BAUMAN, Secretary/Foreman

Europe Region

FIONA MACAULAY, President
NEIL HODGSON, President-Elect
JONATHAN REDFERN, Secretary
EDWIGE ZANELLA, Treasurer
JONATHAN CRAIG, Past President

Latin America and Caribbean Region

PEDRO A. ALARCON MEDINA, President
ULISES HERNANDEZ ROMANO, Vice President
JAIME CHECA, President-Elect
IGO SOUZA, Secretary-Treasurer
VICTOR VEGA, Past President

Middle East Region

SALIM AL-MAHROUQI, President
TBD, Vice President
TBD, President-Elect
TBD, Secretary
TBD, Treasurer
ROBERT KUCHINSKI, Past President

ENERGY MINERALS DIVISION

DOUGLAS E. WYATT, President
TBA, President-Elect
TBA, Vice President

The American Association of Petroleum Geologists

BECKY L. KOWALSKI, Secretary/Treasurer
ANNE C. DRAUCKER, Past President

Councillors

Eastern Section, JOE MORRIS
Gulf Coast Section, TBD
Mid-Continent Section, PENG LI
Pacific Section, TBD
Rocky Mountain Section, TBD
Southwest Section, TBD

International Councillors

Africa, TBD
Asia/Pacific, BARRY A. GOLDSTEIN
Canada, JOHN "JOCK" MCCRACKEN
Europe, TBD
Latin America, MIQUEL NICO

Chairs, Committees

WILLIAM AMBROSE, Coal
BRIAN CARDOTT, Coalbed Methane
JEREMY B. PLATT, Energy Economics & Technology
ART JOHNSON, Gas Hydrates
URSULA HAMMES, Shale Gas & Liquids
DEAN ROKASH, Gas (Tight) Sands
PAUL MORGAN, Geothermal
JACK PASHIN, Honors & Awards
FRAN HEIN, Nominations
SHARLEEN OVERLAND, Oil Sands
ALAN BURNHAM, Oil Shale
JACK PASHIN, Publications
FRAN HEIN, Deputy Editor, NRR
MICHAEL D. CAMPBELL, Uranium (Nuclear Minerals)
BRIAN CARDOTT, Website

DIVISION OF ENVIRONMENTAL GEOSCIENCES

STEPHEN TESTA, President
MARY L. BARRETT, President-Elect
MARK D. LOVELL, Vice President
SKYLER SMITH, Secretary/Treasurer
MICHELE L. COONEY, Editor
TIM MURIN, Past President

Advisory Board Members

Chair, TBD
Eastern Section, TIM BASILONE
Gulf Coast Section, TIMOTHY W. DUEX
Mid-Continent Section, ERNEST R. MORRISON
Rocky Mountain Section, DAN W. JACKSON
Southwest Section, CHRIS LEIBL
Pacific Section, ALLEN WAGGONER
Asia Pacific Region, K. B. TRIVEDI
Canada Region, FRANCOIS C. MARECHAL
Europe Region Coordinator, DIRK NIEUWLAND
Middle East Region, ABDULRAHMAN S. AL-SHARHAN
Latin America and Caribbean Region, MELISA GALVAN
At-Large Members, MARK D. LOVELL

Chairs, Standing Committees

E. CHARLOTTE SULLIVAN, CO₂ Sequestration
TBD, Environmental Geophysics
BRUCE D. SMITH, Honors and Awards
GENE L. MURRAY, Hydrogeology

BRUCE D. SMITH, Membership
JEFF PAINE, Nominating
MICHELE L. COONEY, Publications
TIM MURIN, Website

DIVISION OF PROFESSIONAL AFFAIRS

JAMES H. HILL, SR., President
MARK J. GALLAGHER, President-Elect
ANDREA REYNOLDS, Vice President
MARGARET "PEGGY" WILLIAMS, Secretary
STEVEN M. GOOLSBY, Treasurer
CHANDLER WILHELM, Past President

Council Members

Eastern Section, JONATHAN M. BRADY,
JEFFREY R. BRUCE
Gulf Coast Section, RICHARD W. BALL,
EVELYN MEDVIN, MARK A. NORVILLE,
JAMES M. GRUBB, RALPH W. BAIRD
(PAUL M. BASINSKI)
Mid-Continent Section, DONALD G. BURDICK,
DOUGLAS V. DAVIS, JASON HAMILTON
(JAMES P. KOCHICK)
Pacific Section, JOHN T. WILLIAMS
(SARAH D. SALTZER, DOUGLAS A. DRAVES,
NORMAN C. ROSEN)
Rocky Mountain Section
DAVID WAVREK, MARGARET "PEGGY" WILLIAMS
(JEFFREY "JEFF" W. BRAME)
Southwest Section, MICHAEL PARTY (MARGO J. LISS)
Africa Region, BAYO AKINPELU (WASIU ODUFISAN)
Asia Pacific Region, PETER W. BAILLIE
(JOHN G. KALDI)
Canada Region, ROBIN C. MANN
(DAVID B. OLUTUSIN, MARK S. CHALMERS)
Europe Region, MOHIT KHANNA (IAIN P. WRIGHT,
FRANCOIS JEAN GAUTHIER, OLATUNBOSUN OL
OLAGUNDOYE)
Latin America and Caribbean Region, FLAVIO JUAREZ
FEJO
Middle East Region, MOUSSTAPHA M. R. ELBAZ
(DAVE L. CANTRELL)

Chairs, Standing Committees

RICK L. ERICKSEN, Board of Certification
MARK GALLAGHER, Bylaws Committee
SUSAN NASH, Continuing Education
MARK GALLAGHER, Conventions
DAVID HAWK, Governmental Affairs
CHANDLER WILHELM, Awards Committee
RICHARD FRITZ, Membership
CHANDLER WILHELM, Nominating
MICHAEL RAINES, Publications
WILLIAM "BILL" HASKETT, Reserves & Resources
RICK L. ERICKSEN, State Registration
TBA, Website

AAPG FOUNDATION

Board of Trustees

JAMES A. GIBBS, Chairman
M. RAY THOMASSON, Vice Chairman

DAVID W. WORTHINGTON, Secretary
LEE BACKSEN, Treasurer
LARRY L. JONES, Trustee
MICHAEL R. WISDA, Trustee
DAVID K. CURTISS, Executive Director
DAVID LANGE, Deputy Executive Director

HEADQUARTERS STAFF

Executive Director: DAVID K. CURTISS

Deputy Executive Director: DAVID E. LANGE

Director of Science: TBD

**Director of Innovation & Emerging Trends:
SUSAN SMITH NASH**

**Managing Director of Global Business:
ALAN T. WEGENER**

**Director of Administration & Programs:
VERN STEFANIC**

**Africa Region Programs Manager:
DELIA KUYE**

**Asia Pacific Programs Manager:
ADRIENNE PEREIRA**

**Latin America and Caribbean Region
Programs Manager:
EMILY SMITH LLINAS**

**Middle East and Africa Region Director:
ABEER ALZUBAIDI**

AAPG HOUSE OF DELEGATES

Deadline for this section is three months prior to publication.

OFFICERS

CHAIR:

David Entzminger
(Midland, TX)

CHAIR-ELECT:

William "Bill" Houston
(Houghton, MI)

SECRETARY/EDITOR:

Justin Vandenbrink
(Houston, TX)

DELEGATES
*Group Chair

ABILENE

T. J. Hunt

AFRICA

A. Adesida
W. Bosworth
F. Medina
G. E. Odior
L. Olaka
K. B. Trivedi

ALABAMA

D. Hills

ALASKA

K. Helmod

ALBUQUERQUE (NM)

S. P. Cooper
M. A. C. Rogers

APPALACHIAN (WV)

E. Rothman

ARDMORE (OK)

M. D. Allison

ASIA-PACIFIC

J. Chengzao
H. Darman
E. Ginal-Cumblidge
P. Grant
K. Hoshi
J. Kaldi
K. Ko
P. Lloyd
D. Mair
M. McWalter
W. K. Morrison
J. P. Salo
R. Shoup

AUSTIN (TX)

J. Berry
D. B. Dunlap
S. W. Tinker

BATON ROUGE (LA)

D. Carlson

CANADA

P. Bauman
S. Bend
M. L. Blair
D. E. Brown

R. M. Dicks
P. K. Dorrins
R. T. Lemiski
F. C. Marechal
I. Shaw
L. B. Strong
G. D. Wach

COAST (CA)

J. T. Williams

CORPUS CHRISTI (TX)

D. O. Moore

DALLAS (TX)

C. Blair
M. Gallagher
M. Liss
D. Mackenzie
T. G. O'Hare
J. R. Stephens
D. Thomas

EAST TEXAS

R. L. Adams

EL PASO

C. Bailey

EUROPE

J. Casacao
D. R. Cook
G. D. Couples
J. Craig
H. Cromie
K. Gerdes
C. A. Hamilton
B. Horsfield
K. H. Jakobsson
S. Johnsen
P. R. Krois
R. Kudrewicz
P. A. Kukla
I. Le Nir
F. Nader
A. Nemeth
N. Pimentel
M. Rye-Larsen
N. Scarselli
C. Speh

EVERGLADES (FL)

D. Kluesner

FORT SMITH (AR)

T. M. Shields

FORT WORTH (TX)

C. Blair
J. Dugan
R. Harrington
TBD - 1

FOUR CORNERS

J. Corken

GEORGIA

TBD

GRAND JUNCTION (CO)

H. E. Schoenstein

HOUSTON (TX)

J. Allen
R. Archer

R. J. Ardell
L. B. Backsen
M. Barnes
K. C. Bennett
S. H. Brachman
J. Burton
M. M. Cassidy
G. Coburn
M. Dalthorp
C. Desforges
C. M. Dingler
M. Faber

K. Frederick
S. L. Getz
T. Y. Ghazi
G. M. Gillis
L. K. Goetz
P. T. Gordon
P. F. Hoffman
I. Immega
M. Jones

B. J. Katz
D. Kronman
R. Laidacker
S. D. Levine
C. Ludwig
W. Matthews
E. A. Medvin
R. B. Meers
B. Milne-Andrews
D. M. Moore
A. L. Parsons
R. E. Pledger
J. V. Richards
W. C. Riese
P. A. Santogrossi
J. Schulenberg
S. G. Stanley*
C. K. Steffensen
J. W. Tucker
J. Vandenbrink

IDAHO

D. H. Hawk

ILLINOIS

H. E. Leetaru

INDIANA

D. Busch

INDIANA-KENTUCKY

J. T. Smith

KANSAS

D. Davis
E. Morrison

KENTUCKY

P. J. Gooding

LAFAYETTE (LA)

T. A. Helms
G. K. P. Munson, Jr.

LATIN AMERICA & CARIBBEAN

V. Abreu
K. Bayer

S. Brandon
C. Griffith
E. Hernandez
H. Krause
J. P. Lovecchio
P. Marshall
O. Orrego
R. M. Portas

LOS ANGELES (CA)

D. D. Clarke
T. Gross

MICHIGAN BASIN

W. B. Harrison, III
P. J. Voice

MIDDLE EAST

S. Al-Hajri
S. Al-Mahrouqi
H. Al-Otaibi
R. Kuchinski

MISSISSIPPI

M. N. Birdwell

MISSOURI

W. Yang

MONTANA

M. Millard

NEBRASKA

C. Fielding

NEVADA

B. Ehni

NEW MEXICO

J. van Wijk

NEW ORLEANS

A. H. Johnson
E. C. McDade
W. M. Whiting*

NEW YORK

S. A. Epstein
S. Loewenstein

NORTH DAKOTA

R. Carpenter

NORTH TEXAS

C. Reynolds

NORTHERN CALIFORNIA

D. W. Lewis
R. G. Lindblom

NORTHWEST (OR/WA)

J. M. Armentrout
L. B. Thompson

OHIO

P. L. Archer

OKLAHOMA CITY

J. A. Alberts
D. G. Campbell
T. L. Hollrah
L. W. Holman, II
S. A. Ladner
M. W. Smith

PANHANDLE (TX)

J. F. O'Connell

PITTSBURGH (PAPG)

M. A. Jarvis

PITTSBURGH (PGS)

D. A. Billman
A. A. Reynolds

ROCKY MTN. (CO)

S. Adams
E. Bergin
J. Birdwell
P. Bucknam
C. E. Campbell
J. J. Cuzella
E. Davis
J. E. Harris
L. A. M. Johnson
S. G. Kirkwood
R. K. Lewis
G. McClave
A. Steinle
R. Sullivan

ROSWELL (NM)

J. Humphrey

SACRAMENTO (CA)

S. T. Hector

SAN ANGELO (TX)

B. Swartz

SAN JOAQUIN (CA)

A. C. Draucker
C. A. Huggins
L. C. Knauer

SHREVEPORT (LA)

M. Dunham

SOUTH TEXAS

J. Casiano
T. Garcia
K. Helm

SOUTHEASTERN (FL)

D. Cox

TULSA (OK)

T. Benda
R. Fritz
S. Matson

UTAH

T. Chidsey

WASHINGTON (DC)

J. F. Allan
C. Doolan
C. Enomoto

WEST TEXAS

S. Burke
D. Entzminger
J. Gamrod
M. Raines

WYOMING

M. D. Peterson