A

McClure Oil Co.
Sparks, Eckelbarger & Whightsil No 1-8
Sec. 8, T. 10 N. R. 2 W.
Ground Level Elevation 745'

Pure Oil Co.
Merton Emery No. 1
Sec. 21, T. 13 N. R. 1 W.
Ground Level Elevation 683.7'

Tribal Oil Co.
John Kucharski No. 1-32
Sec. 32, T. 17 N. R. 3 E.
Ground Level Elevation 670'

Charles J. Moskowitz
Minnie Biener No. 1
Sec. 13, T. 20 N. R. 4 E.
Ground Level Elevation 815.0'

Brazos-Sun-Superior
State-Foster No 1
Sec. 28, T. 24 N. R. 2 E.
Ground Level Elevation 1457'

Amoco Production Co.
Garland No 1
Sec. 16, T. 28 N. R. 1 E.
Ground Level Elevation 1230'

Natural Gasoline Corp.
State-Howes No. 1
Sec. 20, T. 27 N. R. 8 E.
Ground Level Elevation 900.0'

GAMMA RAY API UNITS 0 150 300

NEUTRON API UNITS 1000 2000

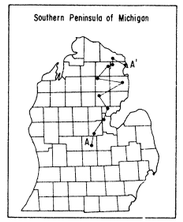
Glacial Drift
JURASSIC
Kimeridgian
MISSISSIPPIAN
PENNSYLVANIAN
Saginaw
"Triple Gyp"
"Brown Lime"
Bayport
Michigan
Michigan "Stray"
Marshall
NEUTRON
Coldwater
Coldwater "Red Rock"
Sunbury
DATUM

DELETED AREA SHOWN ON PLATE 3

DELETED AREA SHOWS SIMILAR RADIOACTIVITY THROUGHOUT

DELETED AREA SHOWS SIMILAR RADIOACTIVITY THROUGHOUT

A'



STRATIGRAPHIC CROSS SECTION A-A'

GRATIOT COUNTY
TO
ALPENA COUNTY

PENNSYLVANIAN &
MISSISSIPPIAN
OF THE
MICHIGAN BASIN

R. T. LILIENTHAL, 1978
DRAWN BY G. A. WILSON

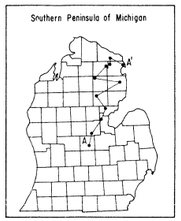
LEGEND

CORRELATION LINE
POSSIBLE CORRELATION
EROSIONAL UNCONFORMITY
DEPOSITIONAL PINCHOUT
POROSITY ZONE

SCALE
Horizontal Scale
None
Vertical Scale
0
100
200

A

A'



STRATIGRAPHIC CROSS SECTION A-A'

GRATIOT COUNTY TO ALPENA COUNTY

LOWER MISSISSIPPIAN & UPPER & MIDDLE DEVONIAN OF THE MICHIGAN BASIN

R. T. LILIENTHAL, 1978
DRAWN BY: G. A. WILSON

LEGEND

- CORRELATION LINE
- POSSIBLE CORRELATION
- EROSIONAL UNCONFORMITY
- DEPOSITIONAL PINCHOUT
- POROSITY ZONE

SCALE
Horizontal Scale None
Vertical Scale
0 — 100 — 200

McClure Oil Co.
Sparks, Eckelbarger & Whightsil No 1-8
Sec 8, T 10 N R 2 W
Ground Level Elevation 745'

GAMMA RAY API UNITS 0 150 300

Berea-Bedford

Pure Oil Co.
Merton Emery No 1
Sec 21, T 13 N R 1 W
Ground Level Elevation 683.7'

GAMMA RAY API UNITS 0 150 300

Berea
Bedford

Tribal Oil Co.
John Kucharski No. 1-32
Sec 32, T 17 N R 3 E
Ground Level Elevation 670'

GAMMA RAY API UNITS 0 150 300

Sunbury
TL-1
TL-2
TL-3
TL-4
TL-5
TL-6

Charles J. Moskowitz
Minnie Biener No 1
Sec 13, T 20 N R 4 E
Ground Level Elevation 815.0'

GAMMA RAY API UNITS 0 150 300

Traverse Group

Brazos-Sun-Superior
State-Foster No 1
Sec 28, T 24 N R 2 E
Ground Level Elevation 1457'

GAMMA RAY API UNITS 0 150 300
NEUTRON API UNITS 1000 2000

Berea-Bedford
Antrim
Traverse Formation
Bell

DEVONIAN

NEUTRON

Natural Gasoline Corp.
State-Howes No 1
Sec 20, T 27 N R 8 E
Ground Level Elevation 900.0'

GAMMA RAY API UNITS 0 200 400

Berea
Bedford

Amoco Production Co.
Garland No 1
Sec 16, T 28 N R 1 E
Ground Level Elevation 1230'

GAMMA RAY API UNITS 0 150 300

TF-1
TL-1
TL-2
TL-3
TL-4
TL-5
TL-6
Traverse Limestone

Getty Oil Co.
Charles A Cain No 1-21
Sec 21, T 31 N R 4 E
Ground Level Elevation 784.2'

CALIPER HOLE DIAM IN INCHES 6 16
GAMMA RAY API UNITS 0 100 200

Glacial Drift
CALIPER
GAMMA RAY

Shell Oil Co.
Shelton-State-Wellington No. 1-34
Sec 13, T 32 N R 5 E
Ground Level Elevation 740.6'

GAMMA RAY API UNITS 0 100 200
SONIC INTERVAL TRANSIT TIME MICROSECONDS PER FOOT 80 60 40 120 100 80

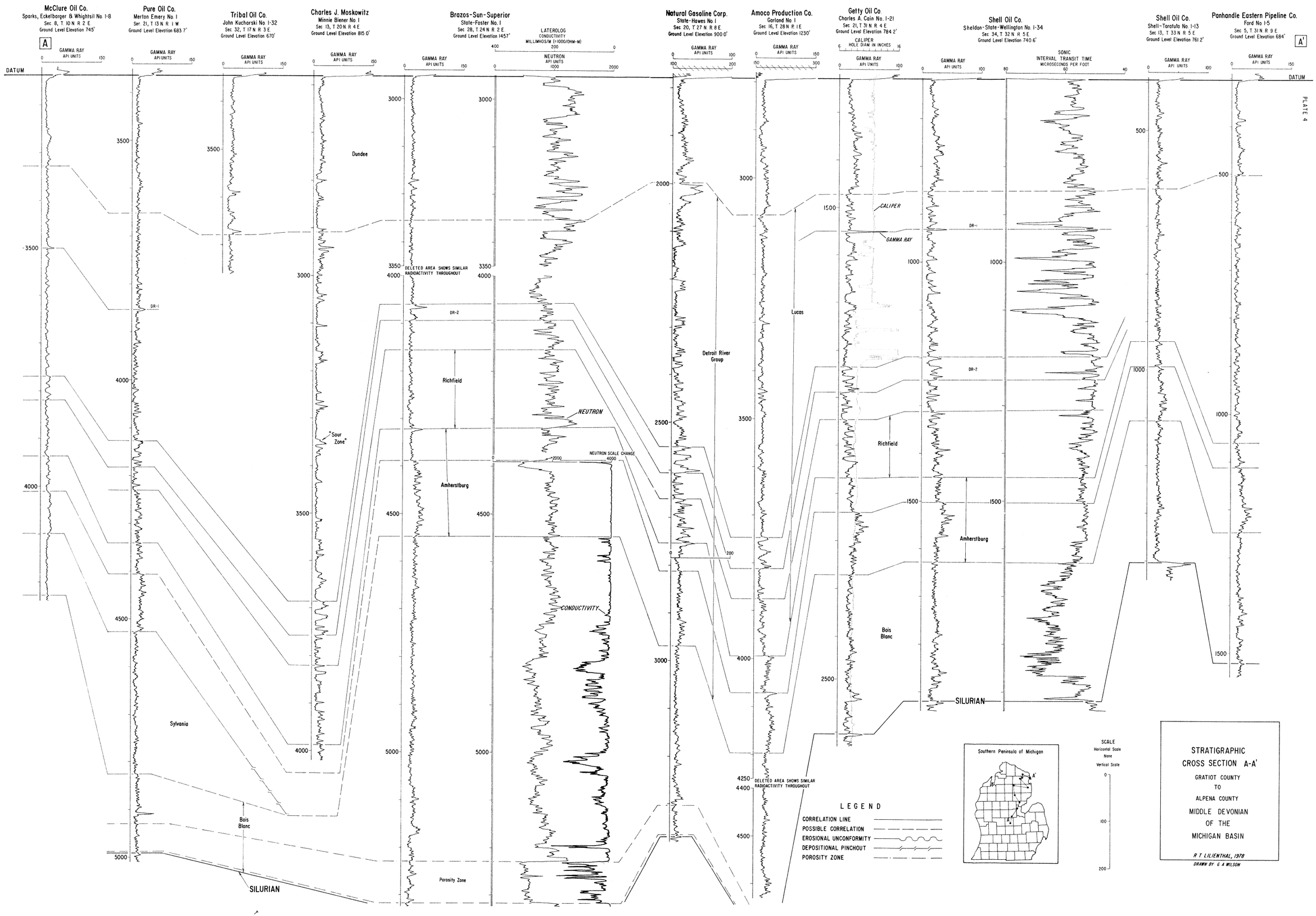
Shell Oil Co.
Shell-Tarafuta No. 1-13
Sec 13, T 33 N R 5 E
Ground Level Elevation 761.2'

GAMMA RAY API UNITS 0 100

Panhandle Eastern Pipeline Co.
Ford No 1-5
Sec 5, T 31 N R 9 E
Ground Level Elevation 684'

GAMMA RAY API UNITS 0 150

DATUM



McClure Oil Co.
Sparks, Eckelberger & Whightsil No. 1-8
Sec. 8, T. 10 N. R. 2 E.
Ground Level Elevation 745'
Pure Oil Co.
Merton Emery No. 1
Sec. 21, T. 13 N. R. 1 W.
Ground Level Elevation 683.7'
Tribal Oil Co.
John Kucharski No. 1-32
Sec. 32, T. 17 N. R. 3 E.
Ground Level Elevation 670'
Charles J. Moskowitz
Minnie Biener No. 1
Sec. 13, T. 20 N. R. 4 E.
Ground Level Elevation 815.0'
Brazos-Sun-Superior
State-Foster No. 1
Sec. 28, T. 24 N. R. 2 E.
Ground Level Elevation 1457'
Natural Gasoline Corp.
State-Hawes No. 1
Sec. 20, T. 27 N. R. 8 E.
Ground Level Elevation 900.0'
Amoco Production Co.
Garland No. 1
Sec. 16, T. 28 N. R. 1 E.
Ground Level Elevation 1230'
Getty Oil Co.
Charles A. Cain No. 1-21
Sec. 21, T. 31 N. R. 4 E.
Ground Level Elevation 784.2'
Shell Oil Co.
Sheldon-State-Wellington No. 1-34
Sec. 34, T. 32 N. R. 5 E.
Ground Level Elevation 740.6'
Shell Oil Co.
Shell-Taratuta No. 1-13
Sec. 13, T. 33 N. R. 5 E.
Ground Level Elevation 761.2'
Panhandle Eastern Pipeline Co.
Ford No. 1-5
Sec. 5, T. 31 N. R. 9 E.
Ground Level Elevation 684'
A
A'
GAMMA RAY
API UNITS
LATEROLOG
CONDUCTIVITY
MILLIMHOS/M (=1000/OHM-M)
NEUTRON
API UNITS
CALIPER
HOLE DIAM IN INCHES
SONIC
INTERVAL TRANSIT TIME
MICROSECONDS PER FOOT
DATUM
Dundee
Sylvania
Bois Blanc
SILURIAN
"Sour Zone"
DR-1
DR-2
Richfield
Amherstburg
Porosity Zone
DELETED AREA SHOWS SIMILAR RADIOACTIVITY THROUGHOUT
NEUTRON SCALE CHANGE
NEUTRON
CONDUCTIVITY
Detroit River Group
Lucas
CALIPER
GAMMA RAY
LEGEND
CORRELATION LINE
POSSIBLE CORRELATION
EROSIONAL UNCONFORMITY
DEPOSITIONAL PINCHOUT
POROSITY ZONE
Southern Peninsula of Michigan
SCALE
Horizontal Scale
None
Vertical Scale
STRATIGRAPHIC
CROSS SECTION A-A'
GRATIOT COUNTY
TO
ALPENA COUNTY
MIDDLE DEVONIAN
OF THE
MICHIGAN BASIN
R. T. LILIENTHAL, 1978
DRAWN BY G. A. WILSON

PLATE 4

A

A'

Pure Oil Co.
Merton Emery No. 1
Sec. 21, T. 13 N. R. 1 W.
Ground Level Elevation 683.7'

McClure Oil Co.
Sparks, Eckelbarger & Whightsil No. 1-8
Sec. 8, T. 10 N. R. 2 W.
Ground Level Elevation 745'

Brazos-Sun-Superior
State-Foster No. 1
Sec. 28, T. 24 N. R. 2 E.
Ground Level Elevation 1457'

Natural Gasoline Corp.
State-Howes No. 1
Sec. 20, T. 27 N. R. 8 E.
Ground Level Elevation 900.0'

Amoco Production Co.
Garland No. 1
Sec. 16, T. 28 N. R. 1 E.
Ground Level Elevation 1230'

Getty Oil Co.
Charles A. Cain No. 1-21
Sec. 21, T. 31 N. R. 4 E.
Ground Level Elevation 784.2'

Shell Oil Co.
Sheldon-State-Wellington No. 1-34
Sec. 34, T. 32 N. R. 5 E.
Ground Level Elevation 740.6'

Shell Oil Co.
Shell-Taratuta No. 1-13
Sec. 13, T. 33 N. R. 5 E.
Ground Level Elevation 761.2'

Panhandle Eastern Pipeline Co.
Ford No. 1-5
Sec. 5, T. 31 N. R. 9 E.
Ground Level Elevation 684'

GAMMA RAY API UNITS

LATEROLOG CONDUCTIVITY MILLIMHOS/M (=1000/OHM-M)

NEUTRON API UNITS

CALIPER HOLE DIAM IN INCHES

SONIC INTERVAL TRANSIT TIME MICROSECONDS PER FOOT

SILURIAN

Bois Blanc

Sylvania

Bass Islands

Salina Group

F Evaporite

F Salt 6

F Salt 5

F Salt 4

F Salt 3

F Salt 2

F Salt 1

G Unit

E Unit

D Evaporite

C Unit

CONDUCTIVITY

NEUTRON

GAMMA RAY

CALIPER

DATUM

STRATIGRAPHIC CROSS SECTION A-A'

GRATIOT COUNTY
TO
ALPENA COUNTY

MIDDLE & LOWER DEVONIAN
& UPPER SILURIAN
OF THE
MICHIGAN BASIN

R. T. LILIENTHAL, 1978
DRAWN BY G. A. WILSON

SCALE
Horizontal Scale
None
Vertical Scale

G UNIT

Southern Peninsula of Michigan

LEGEND

- CORRELATION LINE
- POSSIBLE CORRELATION
- EROSIONAL UNCONFORMITY
- DEPOSITIONAL PINCHOUT
- POROSITY ZONE

A

McClure Oil Co.
Sparks, Eckeibarger & Whightsil No. 1-8
Sec. 8, T. 10 N. R. 2 W.
Ground Level Elevation 745'

Pure Oil Co.
Merton Emery No. 1
Sec. 21, T. 13 N. R. 1 W.
Ground Level Elevation 683.7'

Brazos-Sun-Superior
State-Foster No. 1
Sec. 28, T. 24 N. R. 2 E.
Ground Level Elevation 1457'

Natural Gasoline Corp.
State-Hawes No. 1
Sec. 20, T. 27 N. R. 8 E.
Ground Level Elevation 900.0

Amoco Production Co.
Garland No. 1
Sec. 16, T. 28 N. R. 1 E.
Ground Level Elevation 1230'

Getty Oil Co.
Charles A. Cain No. 1-21
Sec. 21, T. 31 N. R. 4 E.
Ground Level Elevation 784.2'

Shell Oil Co.
Sheldon-State-Wellington No. 1-34
Sec. 34, T. 32 N. R. 5 E.
Ground Level Elevation 740.6'

Shell Oil Co.
Shell-Taratuta No. 1-13
Sec. 13, T. 33 N. R. 5 E.
Ground Level Elevation 761.2'

Panhandle Eastern Pipeline Co.
Ford No. 1-5
Sec. 5, T. 31 N. R. 9 E.
Ground Level Elevation 684'

A'

GAMMA RAY API UNITS

LATEROLOG CONDUCTIVITY MILLIMHOS/M (1000/OHM-M)

NEUTRON API UNITS

CALIPER HOLE DIAM. IN INCHES

SONIC INTERVAL TRANSIT TIME MICROSECONDS PER FOOT

DATUM

LEGEND

- CORRELATION LINE
- POSSIBLE CORRELATION
- EROSIONAL UNCONFORMITY
- DEPOSITIONAL PINCHOUT
- POROSITY ZONE

STRATIGRAPHIC CROSS SECTION A-A'

GRATIOT COUNTY
TO
ALPENA COUNTY
MIDDLE & LOWER SILURIAN
OF THE
MICHIGAN BASIN

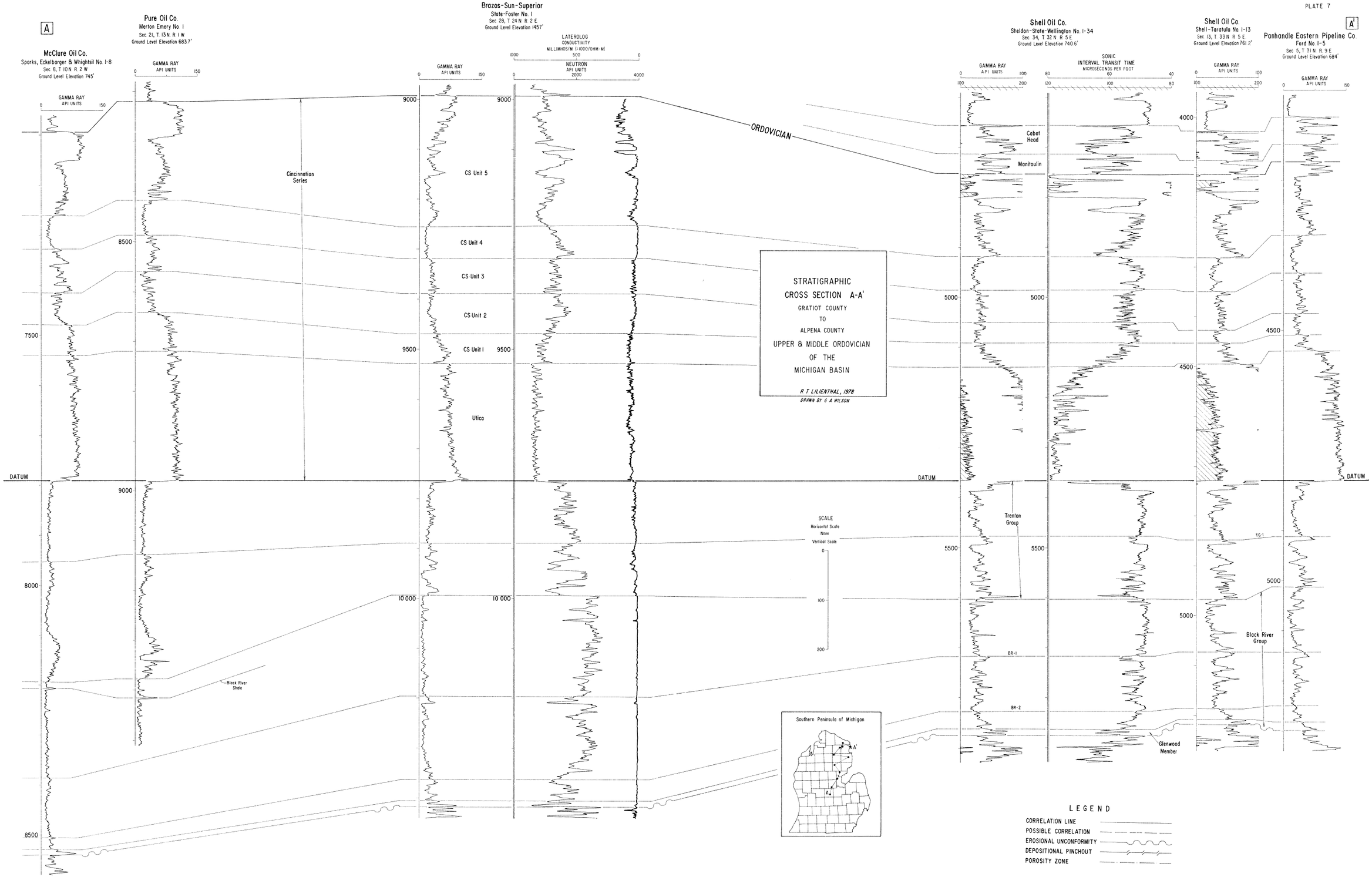
R. T. LILIENTHAL, 1978
DRAWN BY G. A. WILSON

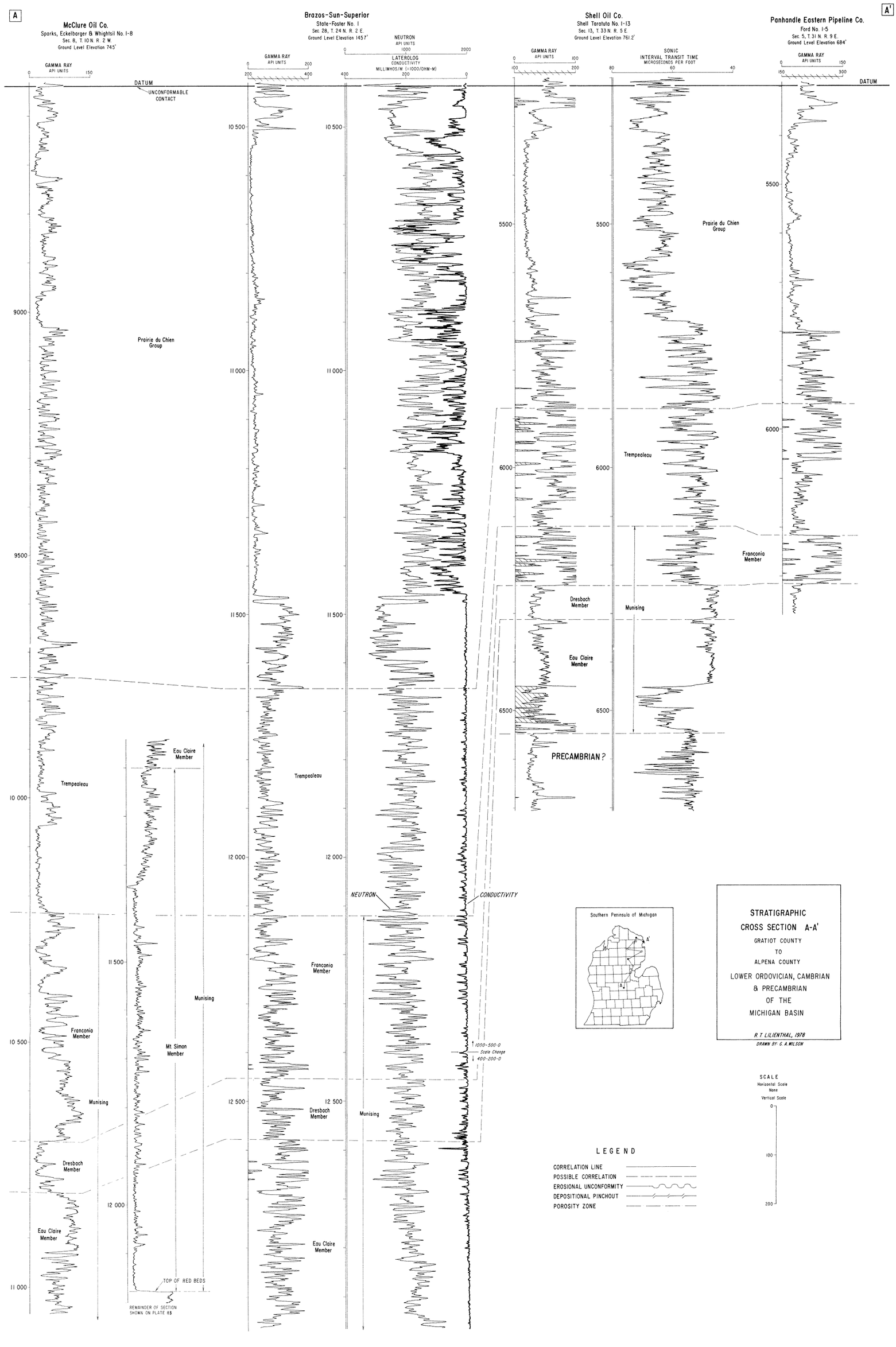
DELETED AREA SHOWS SIMILAR RADIOACTIVITY THROUGHOUT

SCALE
Horizontal Scale
None
Vertical Scale

Southern Peninsula of Michigan

Salina Group
B Evaporite
A-2 Carbonate
A-2 Evaporite
A-1 Carbonate
A-1 Evaporite
Niagara Group
Clinton
Cabot Head
Manitoulin
ORDOVICIAN
SYLVITE
CONDUCTIVITY
NEUTRON
CALIPER
GAMMA RAY


A
A'
McClure Oil Co.
Sparks, Eckelberger & Whightsil No. 1-8
Sec. 8, T 10 N R 2 W
Ground Level Elevation 745'
Pure Oil Co.
Merton Emery No. 1
Sec. 21, T. 13 N. R. 1 W
Ground Level Elevation 683.7'
Brazos-Sun-Superior
State-Foster No. 1
Sec. 28, T 24 N R 2 E
Ground Level Elevation 1457'
Shell Oil Co.
Sheldon-State-Wellington No. 1-34
Sec. 34, T 32 N R 5 E
Ground Level Elevation 740.6'
Shell Oil Co.
Shell-Tarotuta No. 1-13
Sec. 13, T 33 N R 5 E
Ground Level Elevation 761.2'
Panhandle Eastern Pipeline Co.
Ford No. 1-5
Sec. 5, T 31 N R 9 E
Ground Level Elevation 684'
GAMMA RAY
API UNITS
LATEROLOG
CONDUCTIVITY
MILLIMHOS/M (1000/OHM-M)
NEUTRON
API UNITS
SONIC
INTERVAL TRANSIT TIME
MICROSECONDS PER FOOT
Cincinnation Series
CS Unit 5
CS Unit 4
CS Unit 3
CS Unit 2
CS Unit 1
Utica
ORDOVICIAN
Cobot Head
Manitoulin
Trenton Group
Black River Group
Glenwood Member
Black River Shale
DATUM
STRATIGRAPHIC
CROSS SECTION A-A'
GRATIOT COUNTY
TO
ALPENA COUNTY
UPPER & MIDDLE ORDOVICIAN
OF THE
MICHIGAN BASIN
R T LILIENTHAL, 1978
DRAWN BY G A WILSON
SCALE
Horizontal Scale
None
Vertical Scale
Southern Peninsula of Michigan
LEGEND
CORRELATION LINE
POSSIBLE CORRELATION
EROSIONAL UNCONFORMITY
DEPOSITIONAL PINCHOUT
POROSITY ZONE


A
A'
McClure Oil Co.
Sparks, Eckelbarger & Whightsil No. 1-8
Sec. 8, T. 10 N. R. 2 W.
Ground Level Elevation 745'
Brazos-Sun-Superior
State-Foster No. 1
Sec. 28, T. 24 N. R. 2 E.
Ground Level Elevation 1457'
Shell Oil Co.
Shell Tarahta No. 1-13
Sec. 13, T. 33 N. R. 5 E.
Ground Level Elevation 761.2'
Panhandle Eastern Pipeline Co.
Ford No. 1-5
Sec. 5, T. 31 N. R. 9 E.
Ground Level Elevation 684'
GAMMA RAY
API UNITS
NEUTRON
API UNITS
LATEROLOG
CONDUCTIVITY
MILLIMHOS/M (1-1000/OHM-M)
SONIC
INTERVAL TRANSIT TIME
MICROSECONDS PER FOOT
DATUM
UNCONFORMABLE CONTACT
Prairie du Chien Group
Trempealeau
Franconia Member
Dresbach Member
Eau Claire Member
Munising
Mt. Simon Member
PRECAMBRIAN?
TOP OF RED BEDS
REMAINDER OF SECTION SHOWN ON PLATE 83
NEUTRON
CONDUCTIVITY
1000-500-0
Scale Change
400-200-0
Southern Peninsula of Michigan
STRATIGRAPHIC CROSS SECTION A-A'
GRATIOT COUNTY TO ALPENA COUNTY
LOWER ORDOVICIAN, CAMBRIAN & PRECAMBRIAN OF THE MICHIGAN BASIN
R. T. LILIENTHAL, 1978
DRAWN BY: G. A. WILSON
SCALE
Horizontal Scale None
Vertical Scale
LEGEND
CORRELATION LINE
POSSIBLE CORRELATION
EROSIONAL UNCONFORMITY
DEPOSITIONAL PINCHOUT
POROSITY ZONE
PLATE 8

A

B

McClure Oil Co.
Sparks, Eckelbarger & Whightsil No 1-8
Sec 8, T 10 N R 2 W
Ground Level Elevation 745'

Pure Oil Co.
Merton Emery No 1
Sec 21, T 15 N R 1 W
Ground Level Elevation 683.7'

Tribal Oil Co.
Roy Nettleton No 1-26
Sec 26, T 19 N R 1 W
Ground Level Elevation 745.3'

Union Oil Co. of California
State Beaver Creek No C-4
Sec 21, T 25 N R 4 W
Ground Level Elevation 1226.0'

Union Oil Co. of California
State Maple Forest No 1-4
Sec 4, T 28 N R 3 W
Ground Level Elevation 1384.0'

Woody's Oil & Gas, Inc.
Saddler No 1-35
Sec 35, T 31 N R 2 W
Ground Level Elevation 1148.0'

GAMMA RAY API UNITS

NEUTRON API UNITS

JURASSIC

PENNSYLVANIAN

MISSISSIPPIAN

Kimeridgian

Saginaw

Michigan

Boyport

"Triple Gyp"

"Brown Lime"

Michigan "Stray"

Sunbury

Glacial Drift

Michigan

Marshall

Coldwater

DELETED AREA SHOWN ON PLATE 2

DELETED AREA SHOWS SIMILAR RADIOACTIVITY THROUGHOUT

DELETED AREA SHOWS SIMILAR RADIOACTIVITY THROUGHOUT

DATUM

DATUM

STRATIGRAPHIC CROSS SECTION A-B

GRATIOT COUNTY
TO
EMMET COUNTY

PENNSYLVANIAN & MISSISSIPPIAN OF THE MICHIGAN BASIN

R T LILIENTHAL, 1978
DRAWN BY G A WILSON

LEGEND

- CORRELATION LINE
- POSSIBLE CORRELATION
- EROSIONAL UNCONFORMITY
- DEPOSITIONAL PINCHOUT
- POROSITY ZONE

SCALE
Horizontal Scale
None
Vertical Scale

Southern Peninsula of Michigan