PLATE 20

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

A

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

Miller Bros.
Clara Gibbons No. 1-26
Sec. 26, T. 27 N R. 6 W
Ground Level Elevation 1165'

C. J. Simpson
Lake Horicon Corp. No. 1
Sec. 2, T 29 N R 4 W
Ground Level Elevation 1402.0'

Forrest H. Lindsay
Wolgamott No. 1
Sec 19, T 32 N R 8 W
Ground Level Elevation 867.8'

Paul G. Benedum & Mich. Gas Util. Dev. Co.
James E. Clark et ux No 1
Sec 14, T 34 N R 7 W
Ground Level Elevation 704'

McClure Oil Co.
State-Beaver Island No. 1
Sec. 27, T. 38 N R. 10 N
Ground Level Elevation 665.5'

C

GAMMA RAY API UNITS 0 150

GAMMA RAY API UNITS 0 100 / 100 200

GAMMA RAY MICROGRAMS RA-EQ/TON 0 10

BULK DENSITY GRAMS/CC 2.0 2.5 3.0

NEUTRON POROSITY INDEX 45 30 15 0 % LIMESTONE MATRIX -15

DATUM

5500 6000 6500 7000 7100 7200 7500 8000

3500 4000 4500

3000 2500 2000 1500

B Evaporite

A-2 Carbonate

A-2 Evaporite

A-1 Carbonate

A-1 Evaporite

SYLVITE

Salina Group

Niagara Group

Clinton

Cabot Head

Manitoulin

ORDOVICIAN

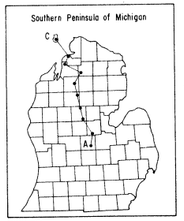
DELETED AREA SHOWS SIMILAR RADIOACTIVITY THROUGHOUT

COMPENSATED NEUTRON POROSITY

BULK DENSITY

LEGEND

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



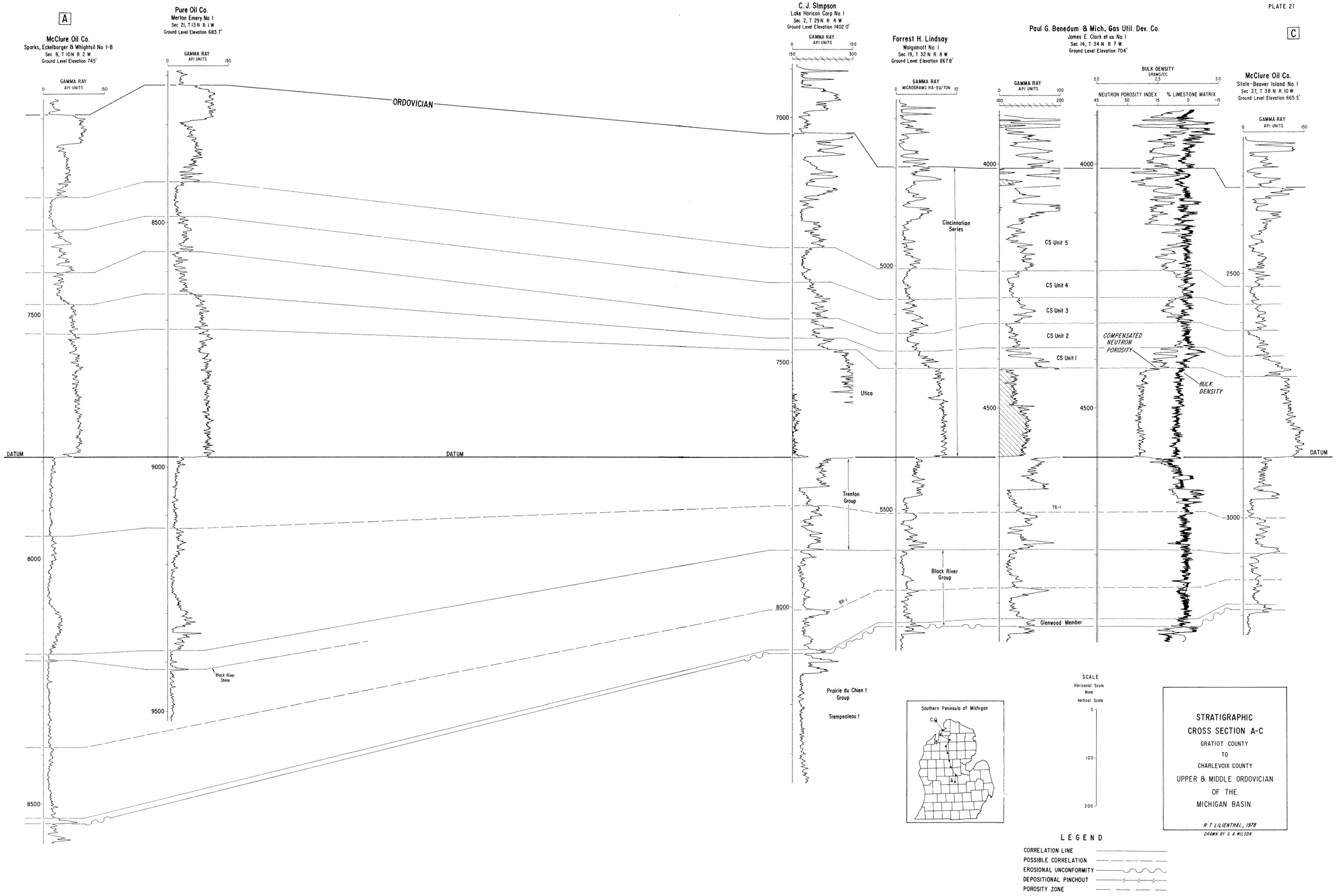
STRATIGRAPHIC CROSS SECTION A-C

GRATIOT COUNTY
TO
CHARLEVOIX COUNTY

MIDDLE & LOWER SILURIAN
OF THE
MICHIGAN BASIN

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

SCALE
Horizontal Scale
None
Vertical Scale
0 100 200


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'
C. J. Simpson
Lake Horicon Corp No. 1
Sec. 2, T 29 N. R. 4 W.
Ground Level Elevation 1402.0'
Forrest H. Lindsay
Wolgamott No. 1
Sec. 19, T 32 N. R. 8 W.
Ground Level Elevation 867.8'
Paul G. Benedum & Mich. Gas Util. Dev. Co.
James E. Clark et ux No. 1
Sec. 14, T 34 N. R. 7 W.
Ground Level Elevation 704'
C
McClure Oil Co.
State-Beaver Island No. 1
Sec. 27, T 38 N. R. 10 W.
Ground Level Elevation 665.5'
GAMMA RAY
API UNITS
MICROGRAMS RA-EQ/TON
BULK DENSITY
GRAMS/CC
NEUTRON POROSITY INDEX
% LIMESTONE MATRIX
ORDOVICIAN
DATUM
Cincinnatian Series
CS Unit 5
CS Unit 4
CS Unit 3
CS Unit 2
CS Unit 1
COMPENSATED NEUTRON POROSITY
BULK DENSITY
Utica
Trenton Group
TG-1
Black River Group
BR-1
Glenwood Member
Black River Shale
Prairie du Chien ? Group
Trempealeau ?
Southern Peninsula of Michigan
SCALE
Horizontal Scale
None
Vertical Scale
STRATIGRAPHIC
CROSS SECTION A-C
GRATIOT COUNTY
TO
CHARLEVOIX COUNTY
UPPER & MIDDLE ORDOVICIAN
OF THE
MICHIGAN BASIN
R T LILIENTHAL, 1978
DRAWN BY G A WILSON
LEGEND
CORRELATION LINE
POSSIBLE CORRELATION
EROSIONAL UNCONFORMITY
DEPOSITIONAL PINCHOUT
POROSITY ZONE

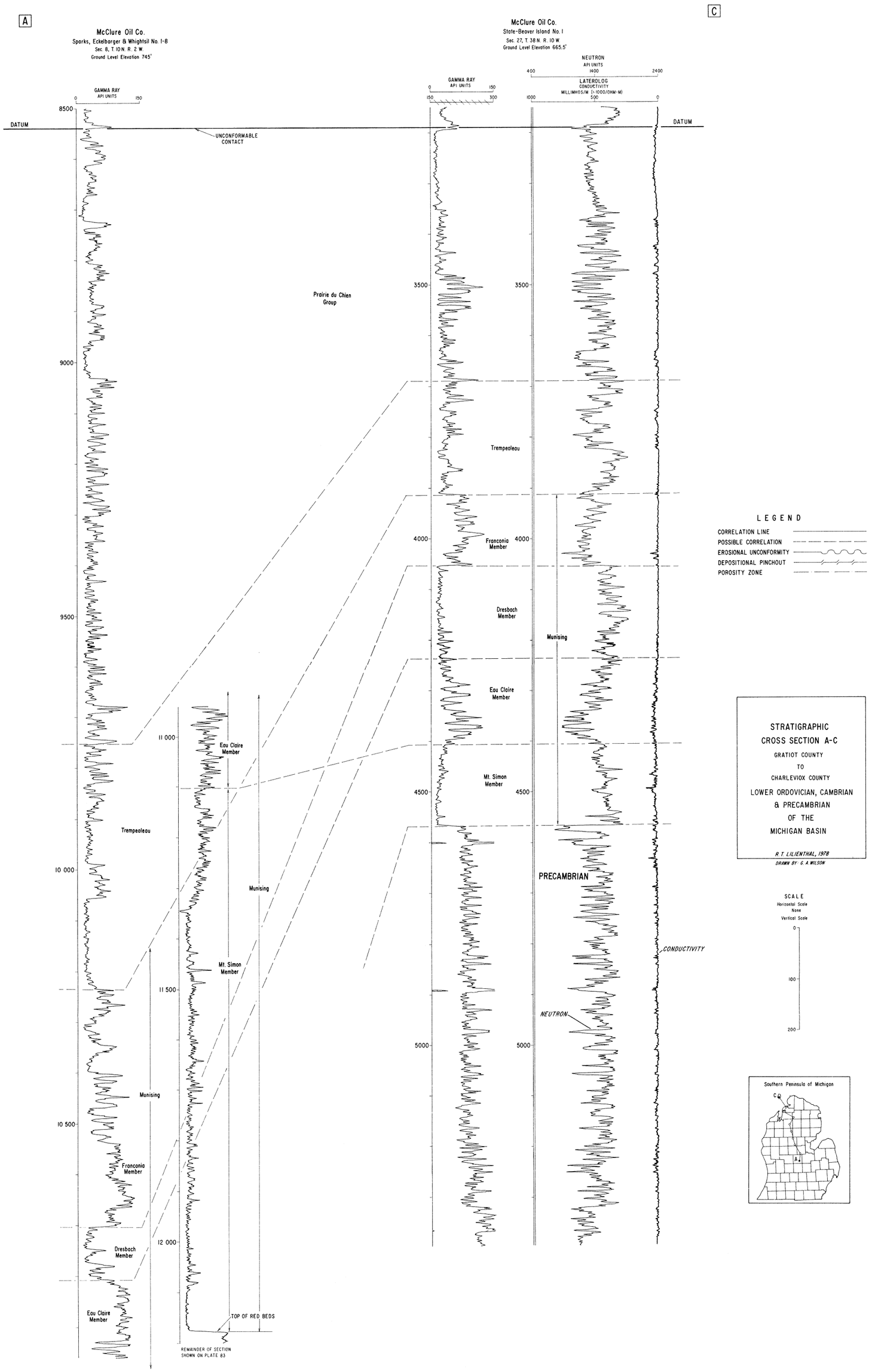

A
McClure Oil Co.
Sparks, Eckelborger & Whightsil No. 1-8
Sec. 8, T. 10 N. R. 2 W.
Ground Level Elevation 745'
GAMMA RAY
API UNITS
0
150
DATUM
UNCONFORMABLE CONTACT
8500
9000
9500
10 000
10 500
11 000
11 500
12 000
Trempealeau
Franconia Member
Dresbach Member
Eau Claire Member
Munising
Mt. Simon Member
TOP OF RED BEDS
REMAINDER OF SECTION SHOWN ON PLATE 83
McClure Oil Co.
State-Beaver Island No. 1
Sec. 27, T. 38 N. R. 10 W.
Ground Level Elevation 665.5'
GAMMA RAY
API UNITS
0
150
150
300
NEUTRON
API UNITS
400
1400
2400
LATEROLOG
CONDUCTIVITY
MILLIMHOS/M (1000/OHM-M)
1000
500
0
DATUM
3500
4000
4500
5000
Prairie du Chien Group
Trempealeau
Franconia Member
Dresbach Member
Eau Claire Member
Mt. Simon Member
Munising
PRECAMBRIAN
CONDUCTIVITY
NEUTRON
C
LEGEND
CORRELATION LINE
POSSIBLE CORRELATION
EROSIONAL UNCONFORMITY
DEPOSITIONAL PINCHOUT
POROSITY ZONE
STRATIGRAPHIC CROSS SECTION A-C
GRATIOT COUNTY TO CHARLEVIOX COUNTY
LOWER ORDOVICIAN, CAMBRIAN & PRECAMBRIAN OF THE MICHIGAN BASIN
R. T. LILIENTHAL, 1978
DRAWN BY: G. A. WILSON
SCALE
Horizontal Scale
None
Vertical Scale
0
100
200
Southern Peninsula of Michigan
C
A

PLATE 22

D

STRATIGRAPHIC CROSS SECTION A-D

GRATIOT COUNTY
TO
LEELANAU COUNTY

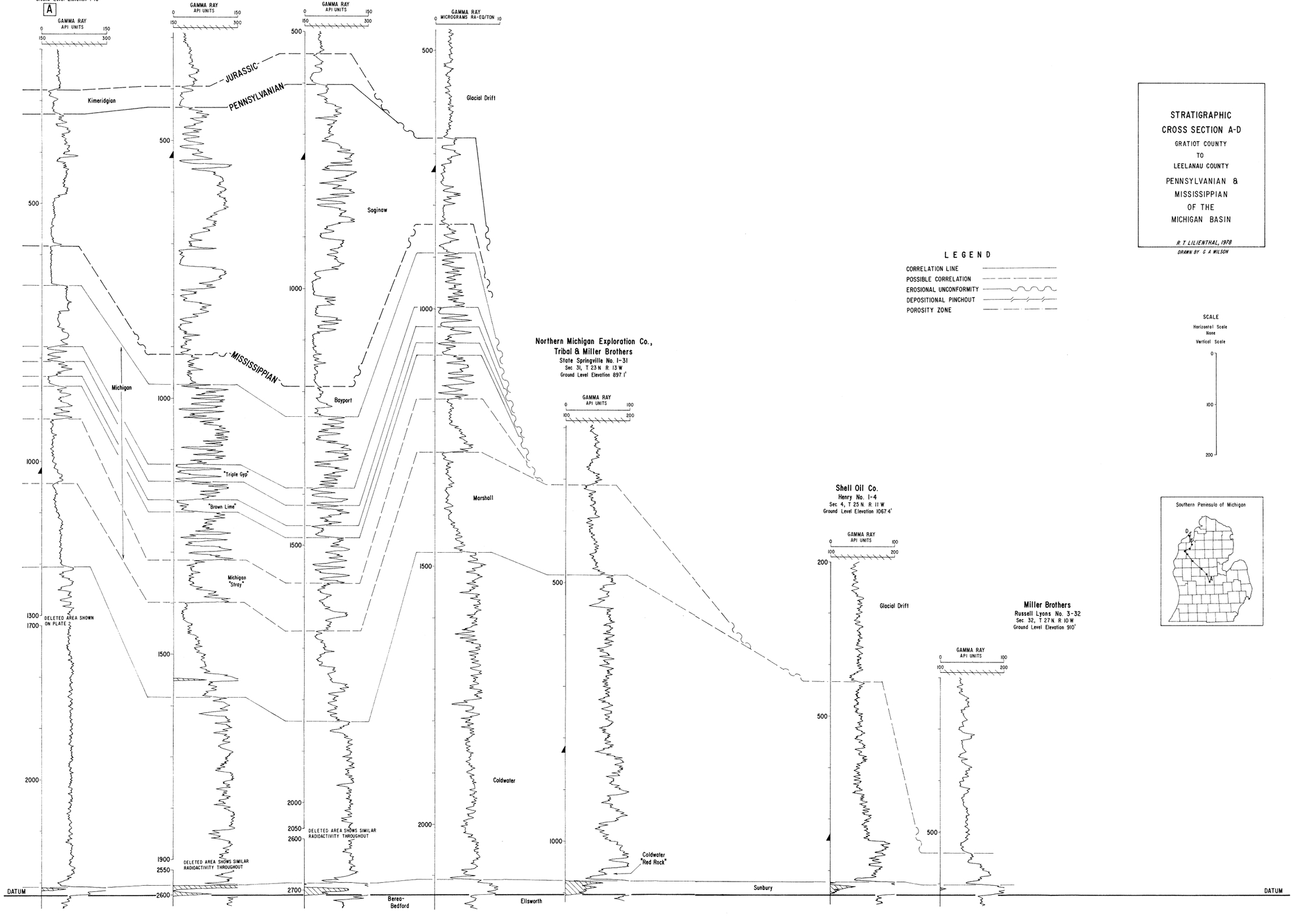
PENNSYLVANIAN & MISSISSIPPIAN OF THE MICHIGAN BASIN

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



A

D

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

McClure Oil Co.
Terry Childs et al No. 1-22
Sec 22, T 13 N R 4 W
Ground Level Elevation 798 6'

Woods Oil Co.
Merrill Palmer School No. 1
Sec 8, T 16 N R 6 W
Ground Level Elevation 1058'

Sun Oil Co.
Lindberg No. 1
Sec 19, T 20 N R 10 W
Ground Level Elevation 1168 5'

Northern Michigan Exploration Co., Tribal & Miller Brothers
State Springville No. 1-31
Sec 31, T 23 N R 12 W
Ground Level Elevation 897 1'

C. J. Simpson
Robert & Cecelia Northrup et al No. 1
Sec 8, T 24 N R 13 W
Ground Level Elevation 896 0'

Shell Oil Co.
Henry No. 1-4
Sec 4, T 25 N R 11 W
Ground Level Elevation 1067 4'

Miller Brothers
Russell Lyons No. 3-32
Sec 32, T 27 N R 10 W
Ground Level Elevation 910'

Forrest H. Lindsay
Kirt No. 1
Sec 6, T 30 N R 11 W
Ground Level Elevation 913 1'

GAMMA RAY API UNITS 0 150 150 300

GAMMA RAY MICROGRAMS RA-EQ/TON 0 10 10 20

GAMMA RAY API UNITS 0 100 100 200

GAMMA RAY API UNIT 0 150 150 300

SIDEWALL NEUTRON POROSITY % LIMESTONE 30 20 10 0 -10

DEVONIAN

Berea-Bedford

Antrim

TRANSITION FROM ANTRIM TO ELLSWORTH

Ellsworth

Coldwater

Sunbury

Glacial Drift

Traverse Formation

Traverse Limestone

Traverse Group

Bell

TL-1

TL-2

TL-3

TL-4

TL-5

TL-6

TF-1

Porosity Zone

SIDEWALL NEUTRON POROSITY

DATUM

LEGEND

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

STRATIGRAPHIC CROSS SECTION A-D

GRATIOT COUNTY TO LEELANAU COUNTY

MIDDLE & UPPER DEVONIAN & LOWER MISSISSIPPIAN OF THE MICHIGAN BASIN

R. T. LILIENTHAL, 1978

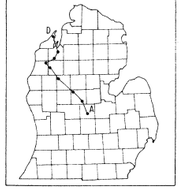
DRAWN BY G. A. WILSON

SCALE

Horizontal Scale None

Vertical Scale 0 100 200

Southern Peninsula of Michigan



A

D

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

McClure Oil Co.
Terry Childs et al No. 1-22
Sec 22, T 13N R 4W
Ground Level Elevation 798.6'

Woods Oil Co.
Merrill Palmer School No. 1
Sec 8, T 16N R 6W
Ground Level Elevation 1058'

Sun Oil Co.
Lindberg No. 1
Sec 19, T 20N R 10W
Ground Level Elevation 1168.5'

Northern Michigan Exploration Co., Tribal & Miller Brothers
State Springville No. 1-31
Sec 31, T 23N R 12W
Ground Level Elevation 897.1'

C. J. Simpson
Robert & Cecelia Northrup et al No. 1
Sec 8, T 24N R 13W
Ground Level Elevation 896.0'

Shell Oil Co.
Henry No. 1-4
Sec 4, T 25N R 11W
Ground Level Elevation 1067.4'

Miller Brothers
Russell Lyons No. 3-32
Sec 32, T 27N R 10W
Ground Level Elevation 910'

Forrest H. Lindsay
Kirt No. 1
Sec 6, T 30N R 11W
Ground Level Elevation 913.1'

GAMMA RAY API UNITS 0 150
GAMMA RAY API UNITS 0 150
GAMMA RAY API UNITS 0 150
GAMMA RAY MICROGRAMS RA-EQ/TON 0 10
GAMMA RAY API UNITS 0 100 100 200
GAMMA RAY API UNITS 0 150
GAMMA RAY API UNITS 0 100
GAMMA RAY API UNITS 100 200
SIDEWALL NEUTRON POROSITY % LIMESTONE 30 20 10 0 -10
GAMMA RAY MICROGRAMS RA-EQ/TON 0 10

DATUM

Bell

Dundee

Porosity Zone

Porosity Zone

DR-1

Detroit River Group

Lucas

DR-2

Richfield

POSSIBLE CORRELATION & POROSITY LINE

Filer?

Sylvania

Bois Blanc

POSSIBLE CORRELATION & POROSITY LINE

Filer?

Amherstburg

SIDEWALL NEUTRON POROSITY

2000 2500 3000 3500 4000

1500 2000 2500 3000 3500 4000

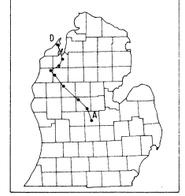
STRATIGRAPHIC CROSS SECTION A-D

GRATIOT COUNTY
TO
LEELANAU COUNTY
MIDDLE DEVONIAN
OF THE
MICHIGAN BASIN

R T LILIENTHAL, 1978
DRAWN BY G A WILSON

SCALE
Horizontal Scale
None
Vertical Scale
0
100
200

Southern Peninsula of Michigan



LEGEND

CORRELATION LINE
POSSIBLE CORRELATION
EROSIONAL UNCONFORMITY
DEPOSITIONAL PINCHOUT
POROSITY ZONE

A

D

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

Northern Michigan Exploration Co., Tribal & Miller Brothers
State Springville No. 1-31
Sec 31, T 23 N R 12 W
Ground Level Elevation 897.1'

C. J. Simpson
Robert & Cecelia Northrup et al No. 1
Sec 8, T 24 N. R. 13 W.
Ground Level Elevation 896.0'

Shell Oil Co.
Henry No. 1-4
Sec 4, T 25 N R 11 W
Ground Level Elevation 1067.4'

Miller Brothers
Russell Lyons No. 3-32
Sec 32, T 27 N R 10 W
Ground Level Elevation 910'

Forrest H. Lindsay
Kirt No. 1
Sec 6, T 30 N R 11 W
Ground Level Elevation 913.1'

GAMMA RAY API UNITS 0 150 / 0 100

SIDEWALL NEUTRON POROSITY % LIMESTONE 30 20 10 0 -10

GAMMA RAY MICROGRAMS RA-EQ/TON 0 10

4000 4500 5000 5500 DATUM

3500 4000 4500 5000 DATUM

2000 2500 3000 3500 4000 4500 5000 DATUM

POSSIBLE CORRELATION & POROSITY

Detroit River Group

Filer?

Amherstburg

Sylvania

Bois Blanc

Porosity Zone

SILURIAN

Salina Group

F Evaporite

G Unit

F Salt 6

F Salt 5

F Salt 4

F Salt 3

F Salt 2

F Salt 1

D Evaporite

C Unit

Bass Islands

Porosity Zone

E Unit

SIDEWALL NEUTRON POROSITY

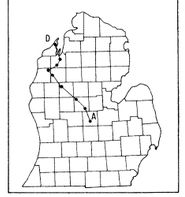
STRATIGRAPHIC CROSS SECTION A-D

GRATIOT COUNTY
TO
LEELANAU COUNTY
MIDDLE & LOWER DEVONIAN
& UPPER SILURIAN
OF THE
MICHIGAN BASIN

R T. LILIENTHAL, 1978
DRAWN BY G A WILSON

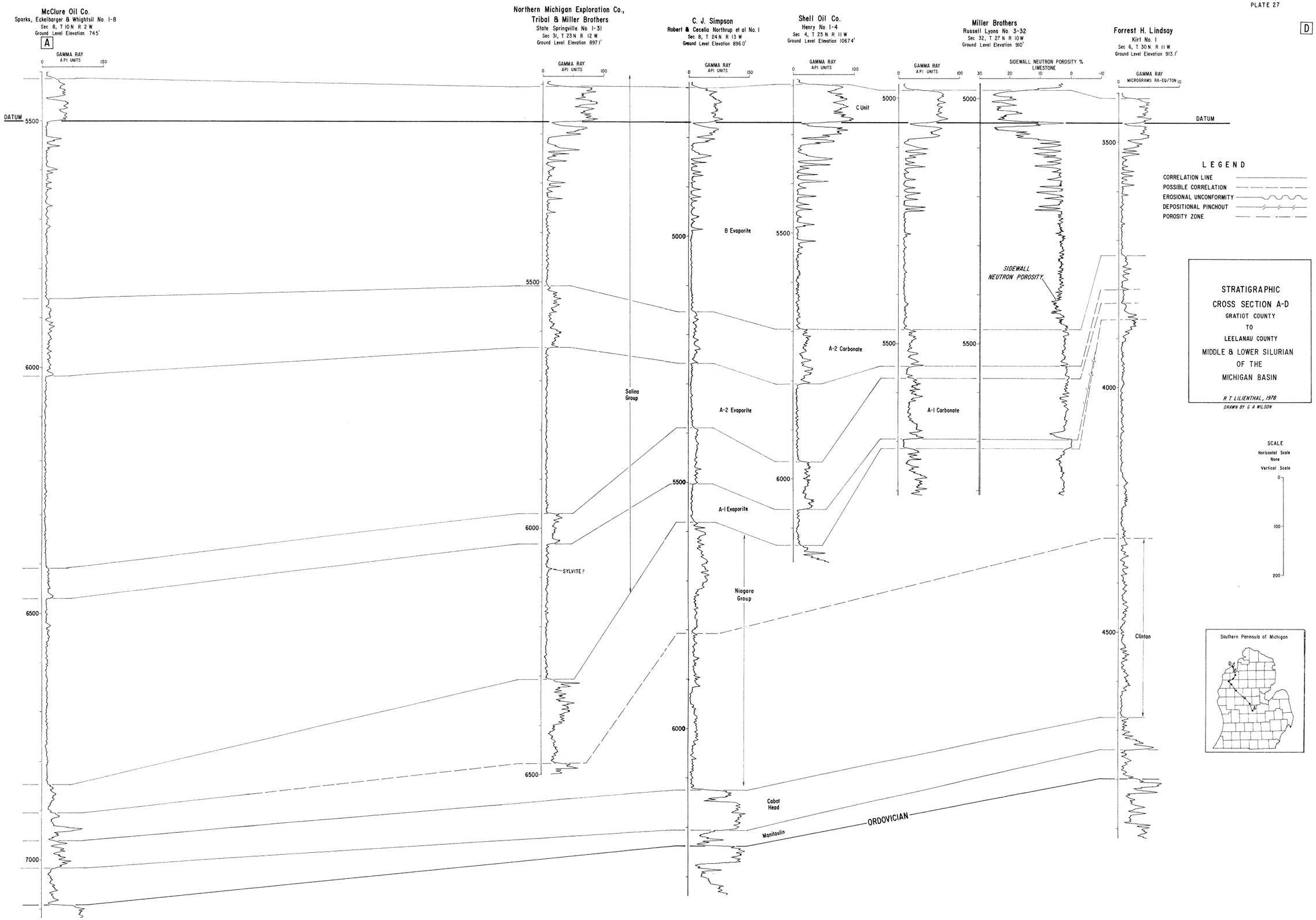
SCALE
Horizontal Scale
None
Vertical Scale
0
100
200

Southern Peninsula of Michigan



LEGEND

CORRELATION LINE
POSSIBLE CORRELATION
EROSIONAL UNCONFORMITY
DEPOSITIONAL PINCHOUT
POROSITY ZONE


D
McClure Oil Co.
Sparks, Eckelbarger & Whightsil No. 1-8
Sec 8, T 10 N R 2 W
Ground Level Elevation 745'
A
GAMMA RAY
API UNITS
0
150
Northern Michigan Exploration Co.,
Tribal & Miller Brothers
State Springville No. 1-31
Sec 31, T 23 N R 12 W
Ground Level Elevation 897.1'
GAMMA RAY
API UNITS
0
100
C. J. Simpson
Robert & Cecelia Northrup et al No. 1
Sec 8, T 24 N R 13 W
Ground Level Elevation 896.0'
GAMMA RAY
API UNITS
0
150
Shell Oil Co.
Henry No. 1-4
Sec 4, T 25 N R 11 W
Ground Level Elevation 1067.4'
GAMMA RAY
API UNITS
0
100
Miller Brothers
Russell Lyons No. 3-32
Sec 32, T 27 N R 10 W
Ground Level Elevation 910'
GAMMA RAY
API UNITS
0
100
SIDEWALL NEUTRON POROSITY %
LIMESTONE
30
20
10
0
-10
Forrest H. Lindsay
Kirt No. 1
Sec 6, T 30 N R 11 W
Ground Level Elevation 913.1'
GAMMA RAY
MICROGRAMS RA-EQ/TON
0
10
DATUM
5500
6000
6500
7000
5000
5500
6000
6500
5000
5500
6000
5500
6000
5000
5500
4000
4500
C Unit
B Evaporite
A-2 Carbonate
A-2 Evaporite
A-1 Carbonate
A-1 Evaporite
SIDEWALL NEUTRON POROSITY
Salina Group
SYLVITE ?
Niagara Group
Clinton
Cabot Head
Manitoulin
ORDOVICIAN
LEGEND
CORRELATION LINE
POSSIBLE CORRELATION
EROSIONAL UNCONFORMITY
DEPOSITIONAL PINCHOUT
POROSITY ZONE
STRATIGRAPHIC
CROSS SECTION A-D
GRATIOT COUNTY
TO
LEELANAU COUNTY
MIDDLE & LOWER SILURIAN
OF THE
MICHIGAN BASIN
R. T. LILIENTHAL, 1978
DRAWN BY G. A. WILSON
SCALE
Horizontal Scale
None
Vertical Scale
0
100
200
Southern Peninsula of Michigan
D
A

A

D

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

C. J. Simpson
Robert & Cecelia Northrup et al No. 1
Sec. 8, T 24 N R 13 W.
Ground Level Elevation 896.0'

Forrest H. Lindsay
Kirt No. 1
Sec. 6, T 30 N R 11 W
Ground Level Elevation 913.1'

GAMMA RAY API UNITS 0 150

GAMMA RAY MICROGRAMS RA-EQ/TON 0 10

ORDOVICIAN

CS Unit 5

CS Unit 4

CS Unit 3

CS Unit 2

CS Unit 1

Cincinnatian Series

Utica

Trenton Group

Black River Group

Glenwood Member

Black River Shale

TG-1

BR-1

BR-2

DATUM

5000

5500

6500

7000

7500

8000

8500

STRATIGRAPHIC CROSS SECTION A-D

GRATIOT COUNTY
TO
LEELANAU COUNTY
UPPER & MIDDLE ORDOVICIAN
OF THE
MICHIGAN BASIN

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

SCALE
Horizontal Scale
None
Vertical Scale
0
100
200

Southern Peninsula of Michigan

LEGEND

CORRELATION LINE
POSSIBLE CORRELATION
EROSIONAL UNCONFORMITY
DEPOSITIONAL PINCHOUT
POROSITY ZONE

E

A

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

GAMMA RAY API UNITS 0 150 150 300

McClure Oil Co.
Betham-Clark Unit No. 1-26
Sec. 26, T 10 N. R 7 W
Ground Level Elevation 865.0'

GAMMA RAY API UNITS 0 200 200 400

Gene Miller, Inc.
C. F. Seaman No. 1
Sec. 15, T 11 N. R 13 W
Ground Level Elevation 803.0'

GAMMA RAY API UNITS 0 165

Thunder Hollow Oil & Gas Co.
Walter-Rosilea Thompson No 1
Sec. 20, T 15 N. R 14 W.
Ground Level Elevation 821'

GAMMA RAY API UNITS 0 200 200 400

Sun Oil Co.
Jacobson No 3
Sec. 14, T 18 N. R 17 W.
Ground Level Elevation 694.5'

GAMMA RAY API UNITS 0 150

JURASSIC

PENNSYLVANIAN

Kimeridgian

Saginaw

MISSISSIPPIAN

Michigan

Michigan "Stray"

Glacial Drift

Bayport

"Triple Gyp"

"Brown Lime"

Marshall

Coldwater

Coldwater "Red Rock"

Ellsworth

DEVONIAN

DELETED AREA SHOWN ON PLATE 2

DELETED AREA SHOWN ON PLATE 34

DATUM

DATUM

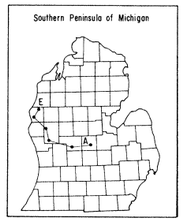
STRATIGRAPHIC CROSS SECTION A-E

GRATIOT COUNTY
TO
MASON COUNTY
PENNSYLVANIAN &
MISSISSIPPIAN
OF THE
MICHIGAN BASIN

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

SCALE
Horizontal Scale
None
Vertical Scale
0
100
200

Southern Peninsula of Michigan



LEGEND

CORRELATION LINE
POSSIBLE CORRELATION
EROSIONAL UNCONFORMITY
DEPOSITIONAL PINCHOUT
POROSITY ZONE