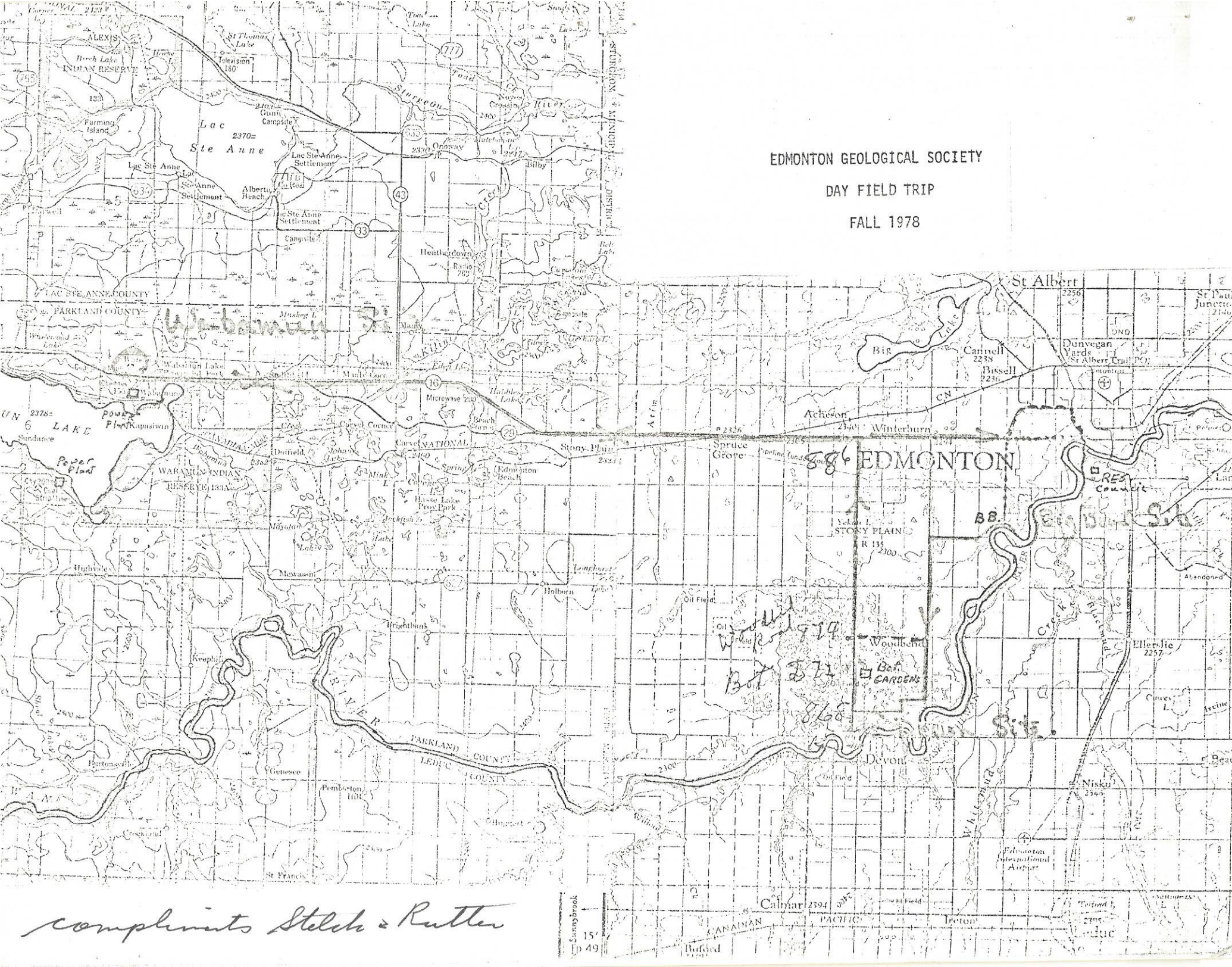


compliments Stelck & Rutter

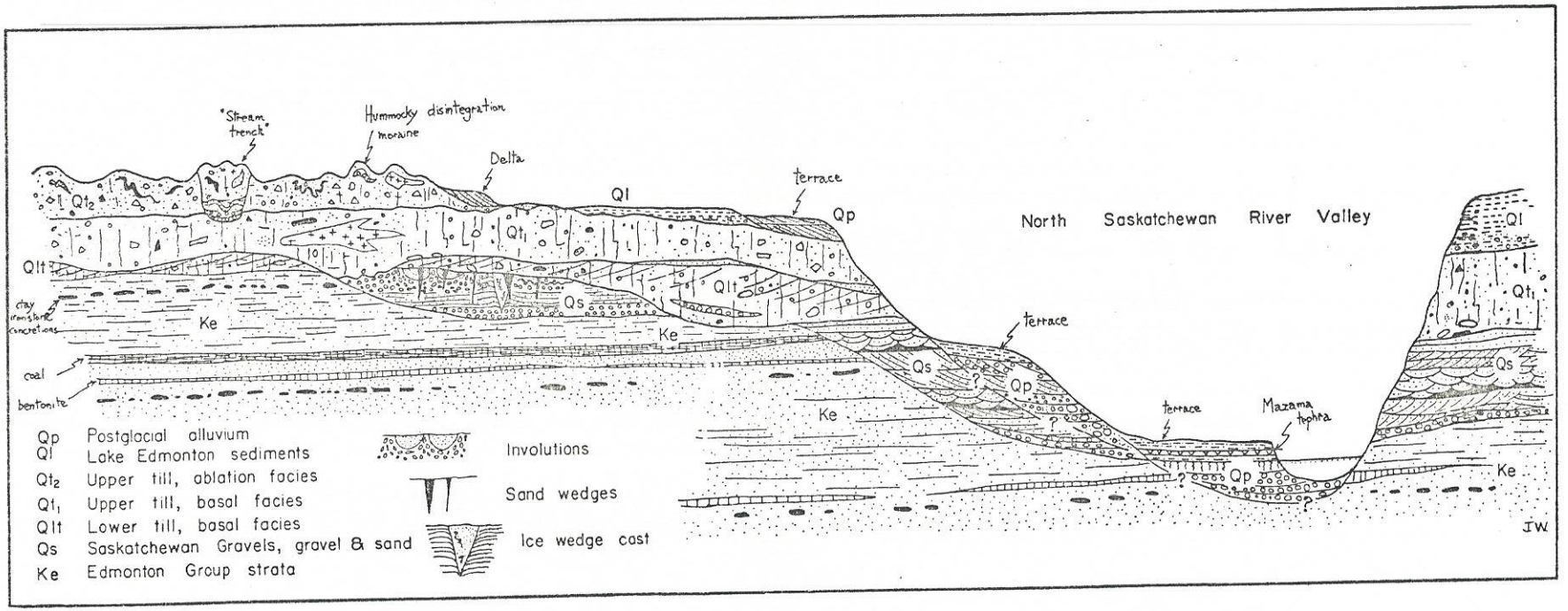


Fig. 4. Diagrammatic geological cross section of the Edmonton region, Alberta

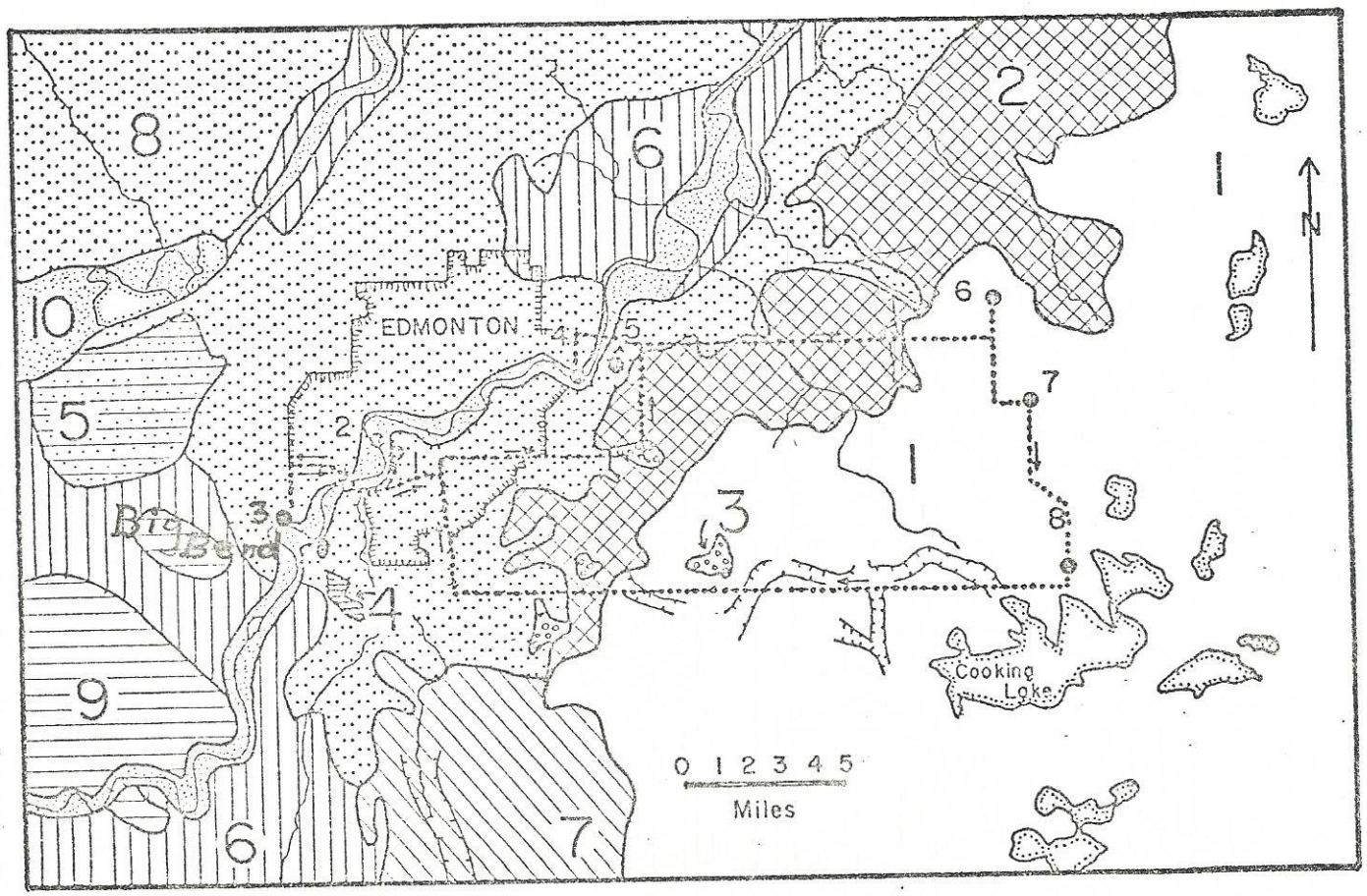


Fig. 1. Route of field trip, location of stops and simplified map (after Bayrock, 1972) of Quaternary landforms and deposits of the Edmonton area. See next page for legend.

3. Big Bend

Fig. 1. Legend. 1. Hummocky disintegration moraine: till; 2. Ground moraine: till; 3. Delta: sand and gravel; 4. Kame: sand and gravel; 5. "Pitted delta": sand, silt and clay; 6. Lacustrine plain: sand and silt; 7. Scabland: sand, gravel, till, local bedrock exposures; 8. Lacustrine plain: clay and silt; 9. Dunes: sand; 10. Bottomland: alluvial gravel, sand, silt and clay

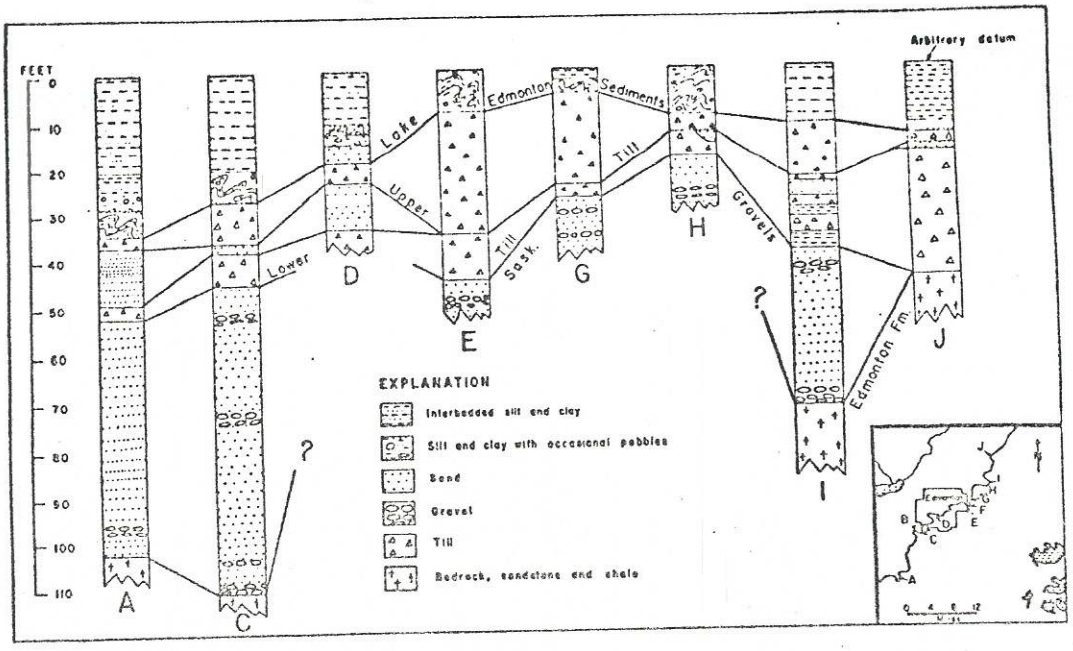


Fig. 3. Stratigraphy of Pleistocene deposits in the Edmonton area,

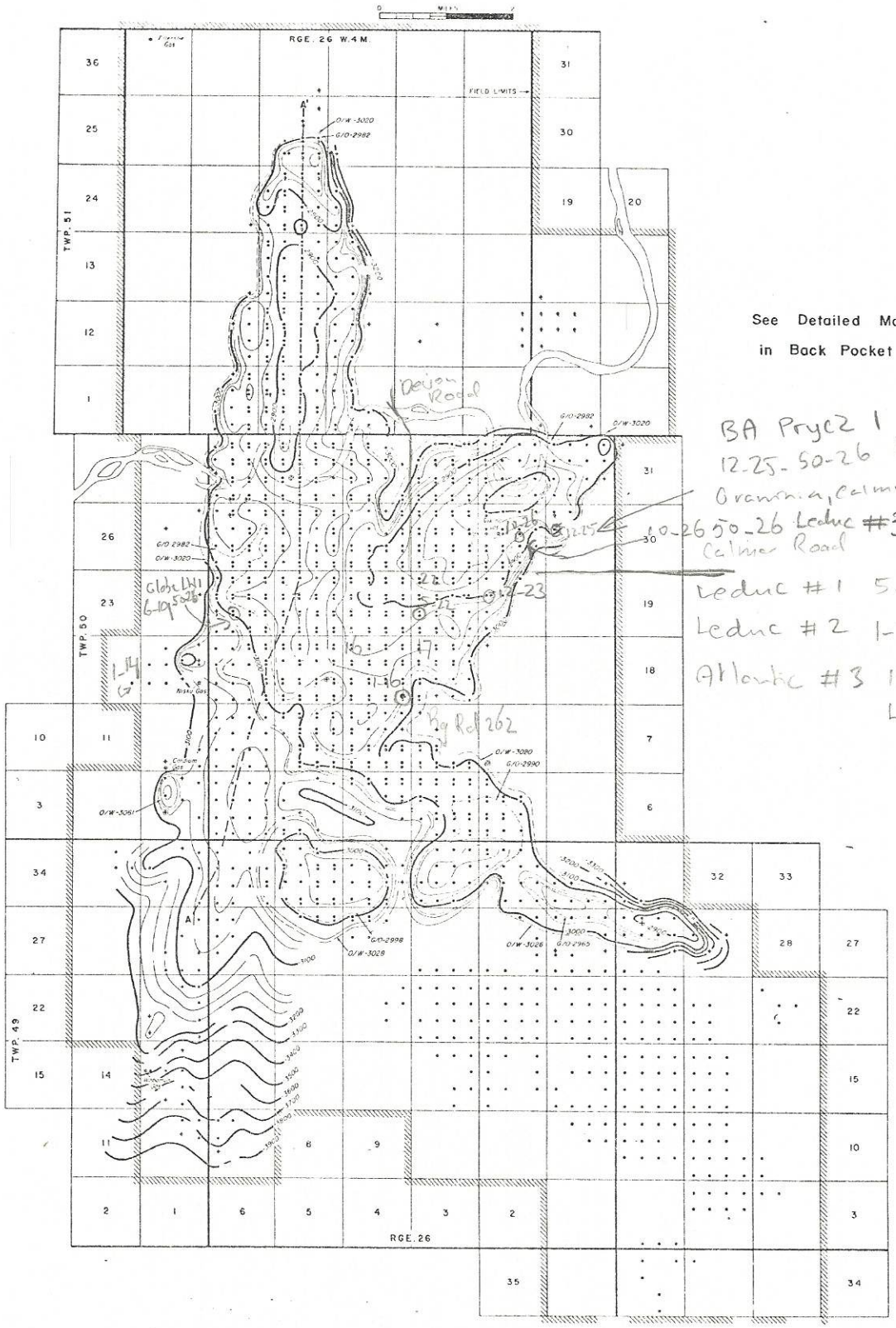
Table 4. Sedimentary succession at Big Bend section, STOP 3 – *Position B*

Age	Description	Average thickness, m
Pleistocene		
	Lake Edmonton sediments	
	Clay, massive in upper part, interbedded with silt in lower part; sample BAK01 for palaeomagnetic analysis collected at 95 cm above base of unit . . .	3.05
	Silt, minor clay; palaeomagnetic samples collected at following places above base of unit: BAF01, 15 cm; BAG01, 55 cm; BAH01, 88 cm; BAI01 and BAI02, 114 cm; BAJ01, 154 cm	1.69
	Silt and fine sand; ripple marks, penecontemporaneous slump structures; angular silt blocks emplaced whilst frozen; sample BAD01 at 16 cm and BAE01 at 36 cm above base of unit.	0.70
	Silt, massive; BAC01 and BAC02 from middle of unit . . .	0.09
	Silt, BAB01 and BAB02 from middle of unit.	0.18
	Diamicton	0.01
	Silt, massive; BAA01 and BAA02 taken 3 cm above base of unit	0.27
	Till; massive, brown, columnar jointing prominent.	3.00
	Till; massive, dark greyish brown, columnar jointing; upper boundary is indistinct; lenses of glacial sand conspicuous near base.	13.70
	Saskatchewan Gravels; sand, cross bedded; minor gravel at base	18.30
Cretaceous		
	Edmonton Group; sandstone, bentonitic.	4.6+

All palaeomagnetic samples from Lake Edmonton sediments have a normal polarity.

Brown till is probably "upper till"; dark greyish brown till is probably the "lower till".

LEDUC FIELD—D-3 POOL



See Detailed Map in Back Pocket

Prepared by: G. B. McCOURT
IMPERIAL OIL LIMITED
AUGUST, 1959

LEDUC WOODBEND FIELD

D3 POOL

TWPS. 49, 50 & 51, RGES. 25 & 26, W.4M.

DISCOVERY DETAILS

Method
Reflection seismograph.

Well
Imperial Leduc No. 2 in 1-16-50-26 W.4M.
Completed: May 20, 1947 at total depth of 5423' in Leduc fm. Perforated: 5382'-5394' and acidized with 250 gallons.
Initial Potential: 1056 B.O.P.D. on 24 hour test with G.O.R. 478 cu. ft./bbl.

GEOLOGY

Producing Zone(s)
Leduc formation, Woodbend group of Upper Devonian.
Nisku formation (see Leduc. Wbd. D2 Pool).
Ellerslie formation (see Gilbert, W. Devon, and N. Wbd. A Pool).
Viking formation (gas).

Other Shows
Wabamun group (oil and gas).

Trap Type
Stratigraphic — reef bioherm surrounded by shale.

Lithology
Dolomite, grey buff brown, medium crystalline, crystalline and vuggy porosity, fractures.

Maximum Reservoir Thickness 1,000'.

Regional Setting
Located southwest of Edmonton in Ireton shale basin at western edge of Cooking Lake shelf along the Rimbey-Morinville reef trend.

Deepest Formation Penetrated
Precambrian — Imp. Leduc 530 in 8-17-50-26 W.4M.

DEVELOPMENT DATA

Total Wells
Completed Oil: 535.
Producing Oil: 529.
Abandoned Oil: 4.
Gas: nil.
Dry and Abandoned: 58.
Water Injection: 3.
Abandoned Oil Wells Injecting Water: 2.

Well Spacing
40 acres.

Logging Practice
First run Electric log to 35 feet above Ireton, second run to total depth.

Completion Practice
10¾" surface casing set at 300'. 7" casing 35' above reservoir, 5½" liner to total depth. Perforate, possible acidization.

RESERVOIR DATA

Type of Drive
Comb. gas cap and water drive.

Estimated Oil in Place
308,000,000 S.T. bbls.

Estimated Recoverable Oil
205,000,000 S.T. bbls.

Oil Zone Thickness
Maximum: 38'. Average: 35'.

Gas Zone Thickness
Maximum: 208'. Average: 57'.

Porosity 8%.

Permeability Excellent.

Area 21,640 acres.

Oil Characteristics
Gravity: 39° A.P.I.
Sulphur: — Trace.
Initial Solution G.O.R.: 508 cu. ft/bbl.
Base: Paraffin.

Pressure Maintenance or Secondary Recovery
Partial water injection in progress. Unitization plan under study with pressure maintenance anticipated in the near future.

PRODUCTION

M.P.R. 50,000 B.O.P.D. (pool).

Economic Allowance — Present: 40 B.O.P.D.
Operating (est.): 28 B.O.P.D.

Market Outlet
Imperial Pipeline Limited to Edmonton terminal.

REFERENCES

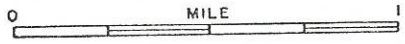
Layer, D. B. and members of staff Imperial Oil Ltd. 1949, Leduc Oil Field, a Devonian Coral Reef Discovery; Bull. Amer. Assoc. Petrol. Geol. Vol. 33 No. 4 pp. 572-602.

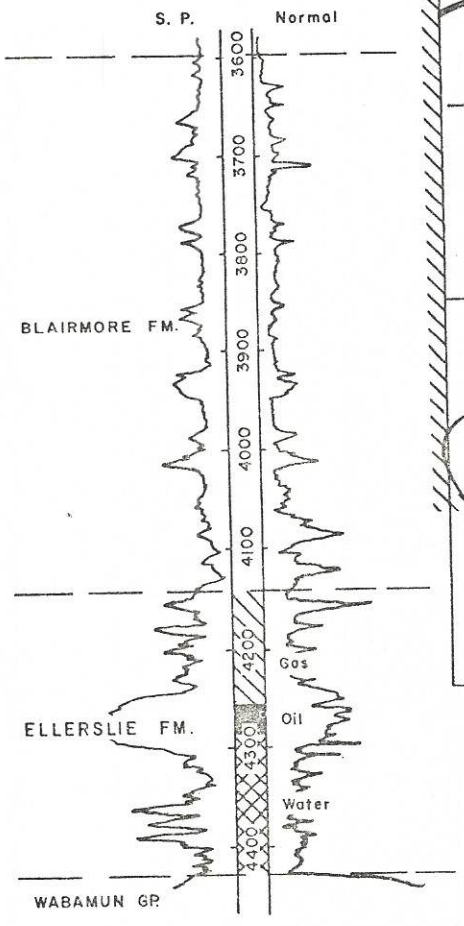
McCourt, G. B., Recent Developments in Leduc Woodbend Field; A.S.P.G., Journal, Vol. I, No. 11, Nov. 53, pp. 3-5.

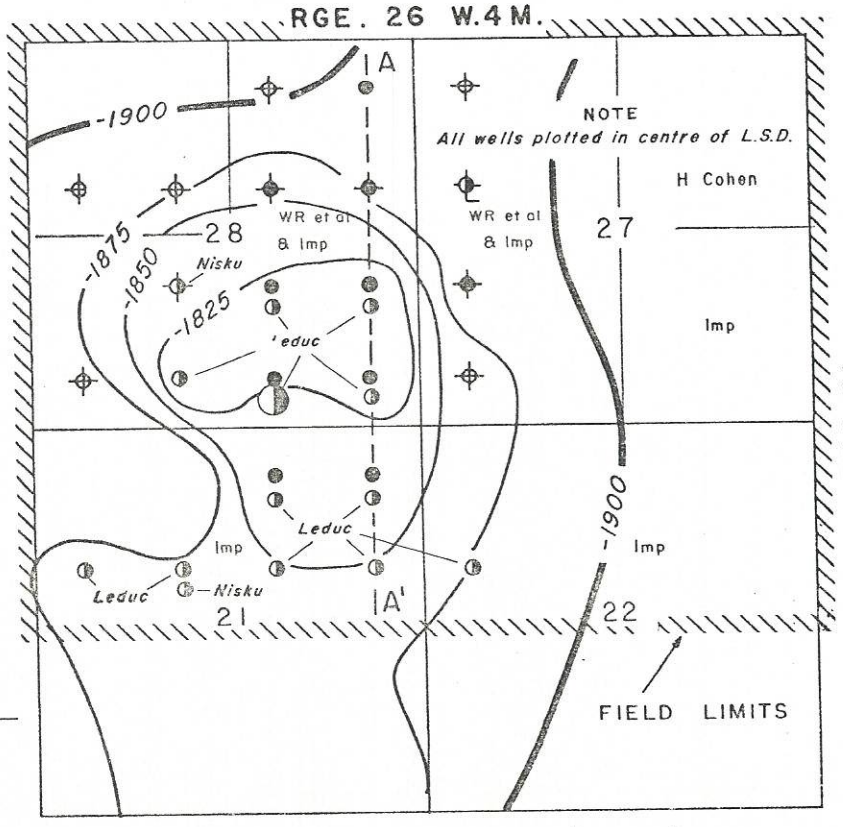
Horsefield, R., Performance of the Leduc D-3 reservoir; Jour. Pet. Tech., Feb., 1959, p. 21.

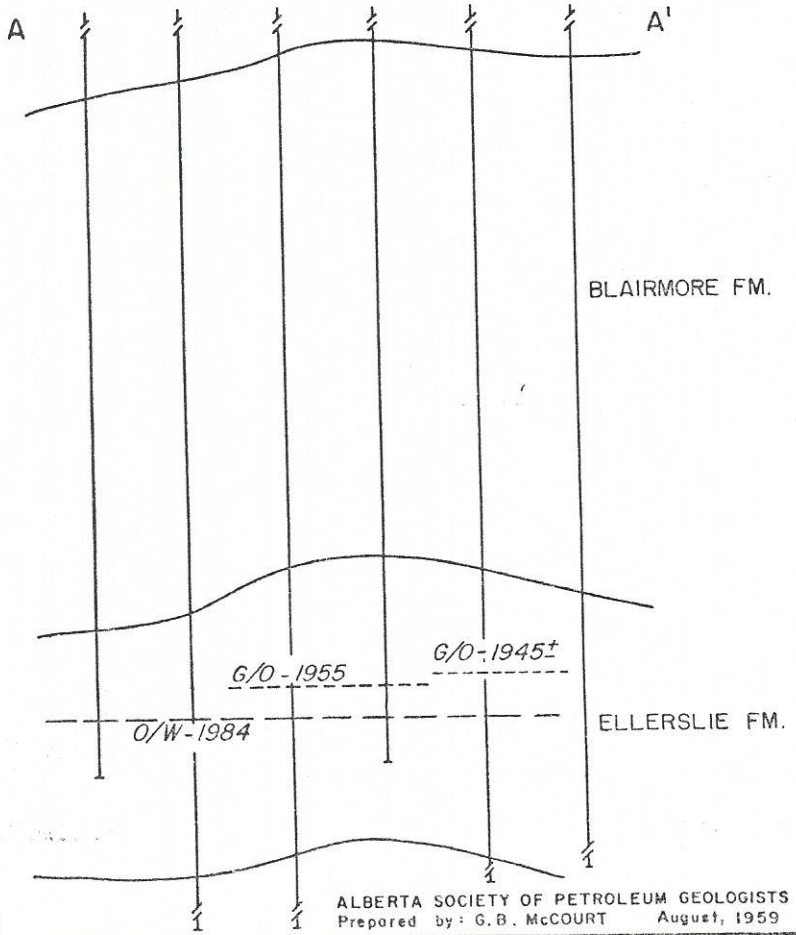
For futher references see Bibliography of Alberta Geology, p. 228.

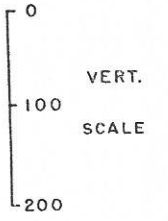
NORTH WOODBEND FIELD
25' CONTOURS ELLERSLIE FM.

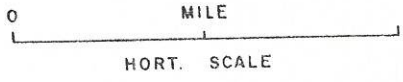












ALBERTA SOCIETY OF PETROLEUM GEOLOGISTS
Prepared by: G.B. McCOURT August, 1959

Prepared by: G. B. McCourt
IMPERIAL OIL LIMITED
AUGUST, 1959

LEDUC WOODBEND FIELD

NORTH WOODBEND A POOL

TWP. 51, RGE. 26, W.4M.

DISCOVERY DETAILS

Method

Subsurface geology.

Well

Name: A.H.C. & E. North Woodbend No. 1 in 2-28-51-26 W.4M.
Completed: June, 1950 in Leduc formation. North Woodbend No. 1C completed in Ellerslie June, 1951.
Perforated: 4276'-4277'.
Initial Potential: 216 B.O.P.D. through 32/64" choke with a G.O.R. of 685 cu. ft./bbl.

GEOLOGY

Producing Zone(s)

Ellerslie formation, Mannville subgroup of Lower Cretaceous.
Leduc formation (see Leduc Woodbend — D3 Pool)
Nisku formation (see Leduc Woodbend — D2 Pool)

Other Shows

Viking formation — gas.

Trap Type

Structure — through differential compaction of underlying beds over Leduc formation.

Lithology

Sandstone, grey to light brown, fine grained, porous, oil stained.

Maximum Reservoir Thickness 300'.

Regional Setting

Overlies north end of the Woodbend reef along the Rimbey Morinville reef trend.

Deepest Formation Penetrated

Beaverhill Lake — N. Woodbend No. 10C in 10-28-51-26 W.4M.

DEVELOPMENT DATA

Total Wells

Completed Oil: 10.
Producing Oil: 7.
Suspended or Abandoned Oil: 3.
Gas: nil.
Dry and Abandoned: 6.
Injection or Disposal — Water: nil, Gas: nil.

Well Spacing

40 acres

Logging Practice

Electric log survey to total depth.

Completion Practice
10¾" surface casing set at 300'. 7" casing run through reservoir and perforated.

RESERVOIR DATA

Type of Drive

Gas cap expansion and water drive.

Estimated Oil in Place

6,600,000 S.T. bbls.

Estimated Recoverable Oil

987,000 S.T. bbls.

Oil Zone Thickness

Maximum: 30' (gross). Average: 14.6' (net).

Gas Zone Thickness

Maximum: 27' gr. Average: 15' gr.

Porosity 17%.

Permeability Good.

Area 600 acres.

Oil Characteristics

Gravity: 36° A.P.I.
Sulphur: 0.31%.
Initial Solution G.O.R.: 400 cu. ft./bbl.
Base: Paraffin.

Pressure Maintenance or Secondary Recovery
None.

PRODUCTION

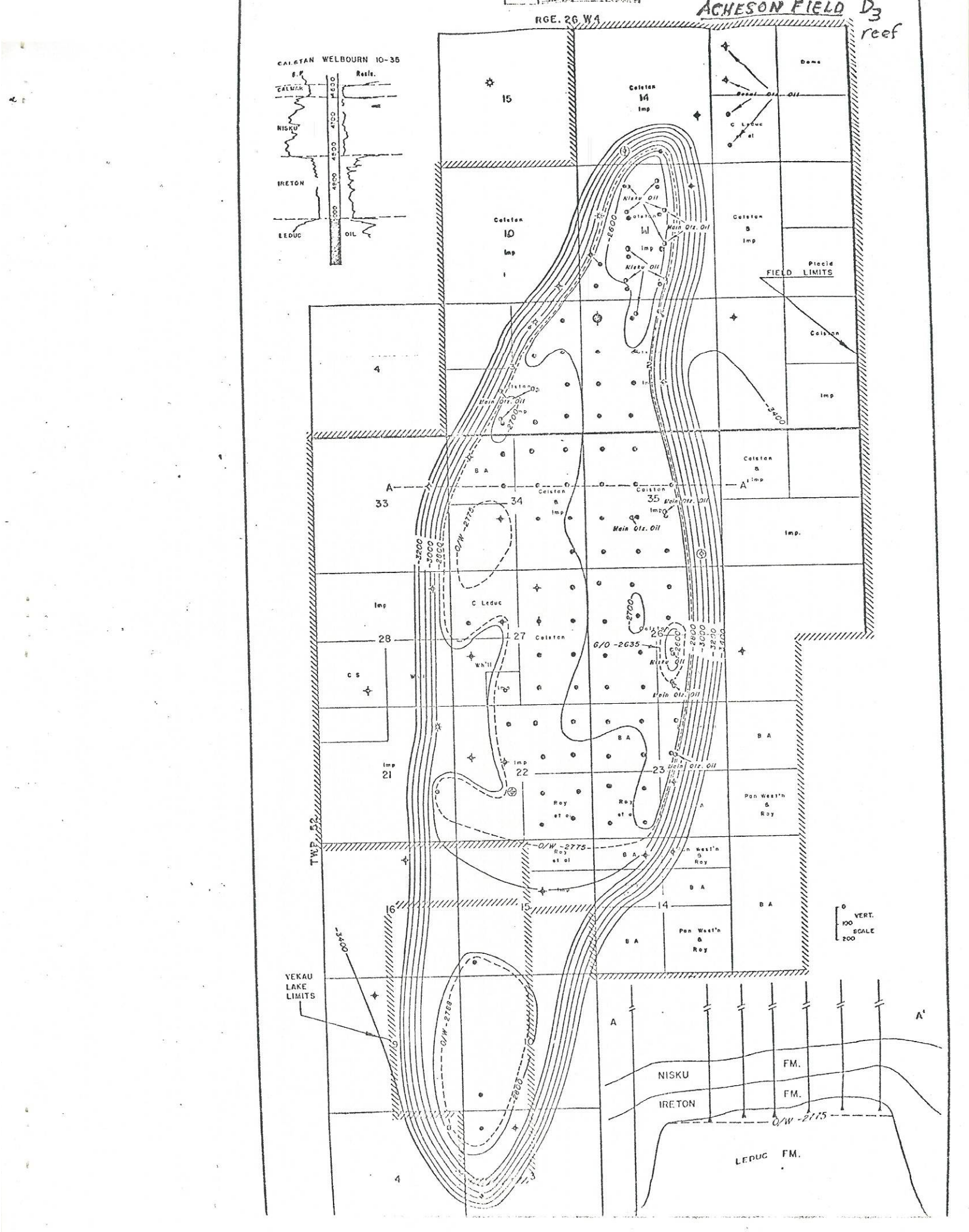
M.P.R. 40 B.O.P.D.

Economic Allowance — Present: 34 B.O.P.D.
Operating (est.): 25 B.O.P.D.

Market Outlet

Imperial Pipeline Limited to Edmonton terminal.

ACHESON FIELD D_3 reef



Prepared by: W. D. SMITH
THE CALIFORNIA STANDARD COMPANY
SEPTEMBER, 1959

ACHESON FIELD
D3 POOL
TWPS. 52 & 53, RGE. 26, W.4M.

DISCOVERY DETAILS

Method
Subsurface geology — including structure test hole work.

Well
Name: Calstan Acheson Prov. No. 1 in 13-2-53-26 W.4M. Completed: September 2, 1950. Treatment: None.
Initial Potential: On six hour test with ½" choke the well flowed at the rate of 1,248 B.O.P.D. with a G.O.R. of 676 cu. ft./bbl.

GEOLOGY

Producing Zone(s)
Leduc formation, Woodbend group of Upper Devonian.
Nisku formation, Winterburn group of Upper Devonian.
Ellerslie formation (gas and oil), Mannville subgroup of Lower Cretaceous.
Viking formation (one gas well), Colorado group of Upper Cretaceous.

Other Shows
None.

Trap Type
Stratigraphic: reef bioherm surrounded by impermeable shale.

Lithology
Fine and medium crystalline white dolomite, very vuggy and moderately fossiliferous, abundant fracturing.

Maximum Reservoir Thickness 1,170'.

Regional Setting
Situated on the east flank of the Alberta Syncline along Rimbey-Meadowbrook reef trend. Paleozoic beds dip gently to the southwest 40' to the mile with a strike of 330°.

Deepest Formation Penetrated
Elk Point (Imperial Stony Plain No. 1 in 8-21-52-26 W.4M.).

DEVELOPMENT DATA

Total Wells
Completed Oil: 91. Gas: nil. Dry and Abandoned: 26.
Producing Oil 86.
Suspended Oil: 2.
Abandoned Oil: 3.
Injection or Disposal — Water: 2, Gas: nil.

Well Spacing 40 acres.

Logging Practice
At Calstan Acheson No. 10-3-53-26, completed in February 1959, a Schlumberger Induction Electric survey and a Microlog-caliper were run to total depth (Leduc formation).

Completion Practice
Most of the Leduc wells were completed open hole. Where the indicated pay section was 30' or more, casing was run after first contact was made with the reef, or to a point estimated to be 10' to 30' above the reef; production tubing was then landed 10' off bottom. This method was basically designed to lessen lost circulation problems in both the Nisku and Leduc. When the indicated pay section was less than 30', the well was cased to approximately 10' below the water line and perforated. No treatment was necessary.

Drilling Problems
Circulation often difficult to maintain while drilling in the D2 and D3 formations.

RESERVOIR DATA

Type of Drive
Bottom water.

Estimated Oil in Place
128,000,000 S.T. bbls. (433 bbls./acre-foot).

Estimated Recoverable Oil
85,550,000 S.T. bbls. (289 bbls./acre-foot).

Oil Zone Thickness
Maximum: 234'. Average: 84'.

Gas Zone Thickness
A small gas cap was found in one well only. It is 42' thick. (Imperial Acheson No. 7-26-52-26).

Porosity 9.1%. **Permeability** 1,000 md.

Area 3,800 acres.

Oil Characteristics
Gravity: 38° A.P.I.
Sulfur: 0.25%.
Initial Solution G.O.R.: 522 cu. ft./bbl.
Base: Paraffin.

Pressure Maintenance
In December 1956 Calstan Aitmiks No. 1-35-52-26 was redrilled to become a fresh water injection well into the Leduc. The well opened 422' of reef which was acidized with 4,000 gals. Dowell XMFW. Water from the North Saskatchewan River is injected at the rate of 11,000 to 13,000 bbls./day. Pool pressure is maintained very near 1,598 P.S.I.G.

PRODUCTION

M.P.R. 20,000 B.O.P.D. (pool).

Economic Allowance — Present: 39 B.O.P.D.
Operating (est.): 28 B.O.P.D.

Market Outlet
Imperial Pipeline to Edmonton terminal.

REFERENCES

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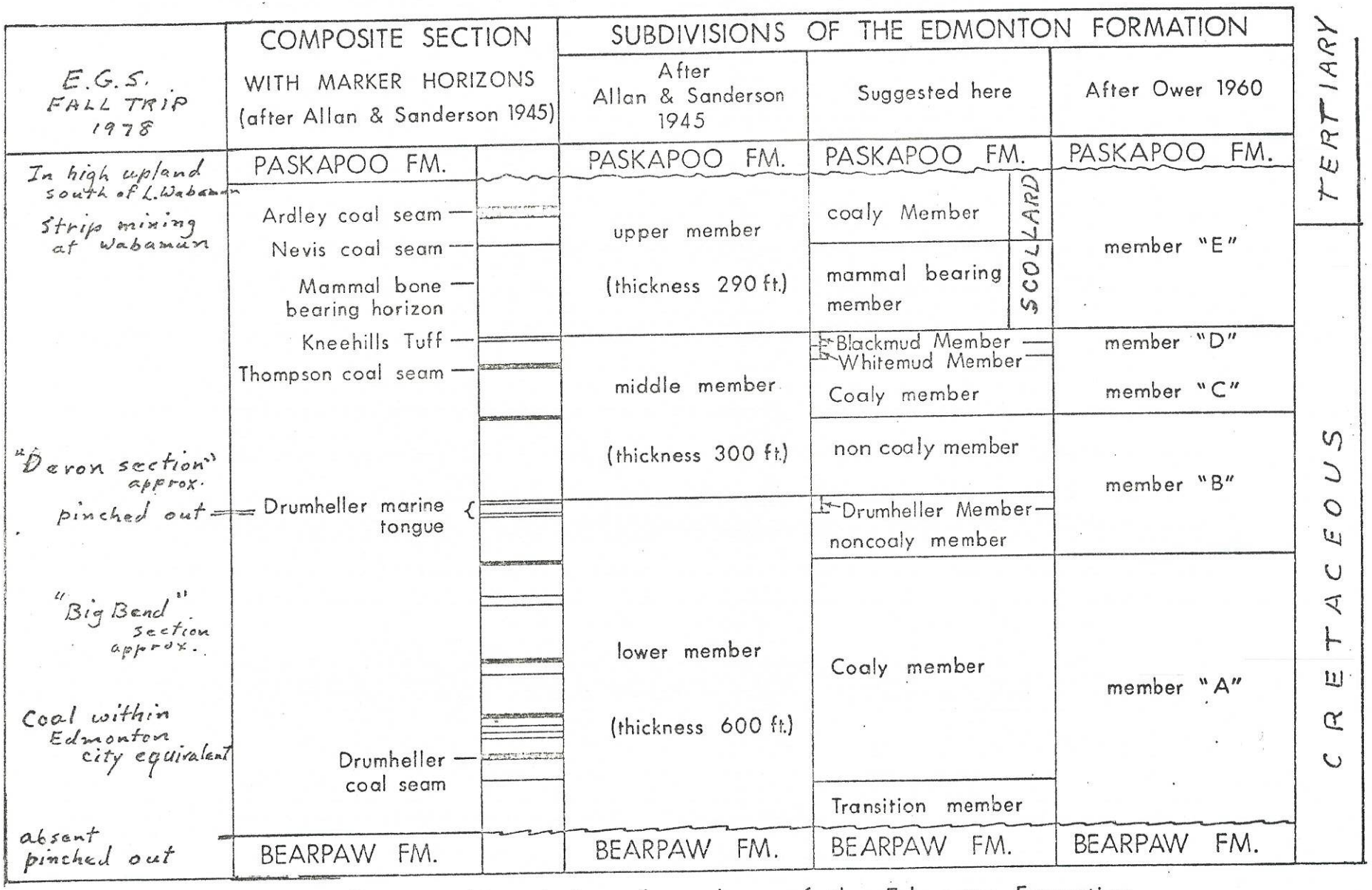
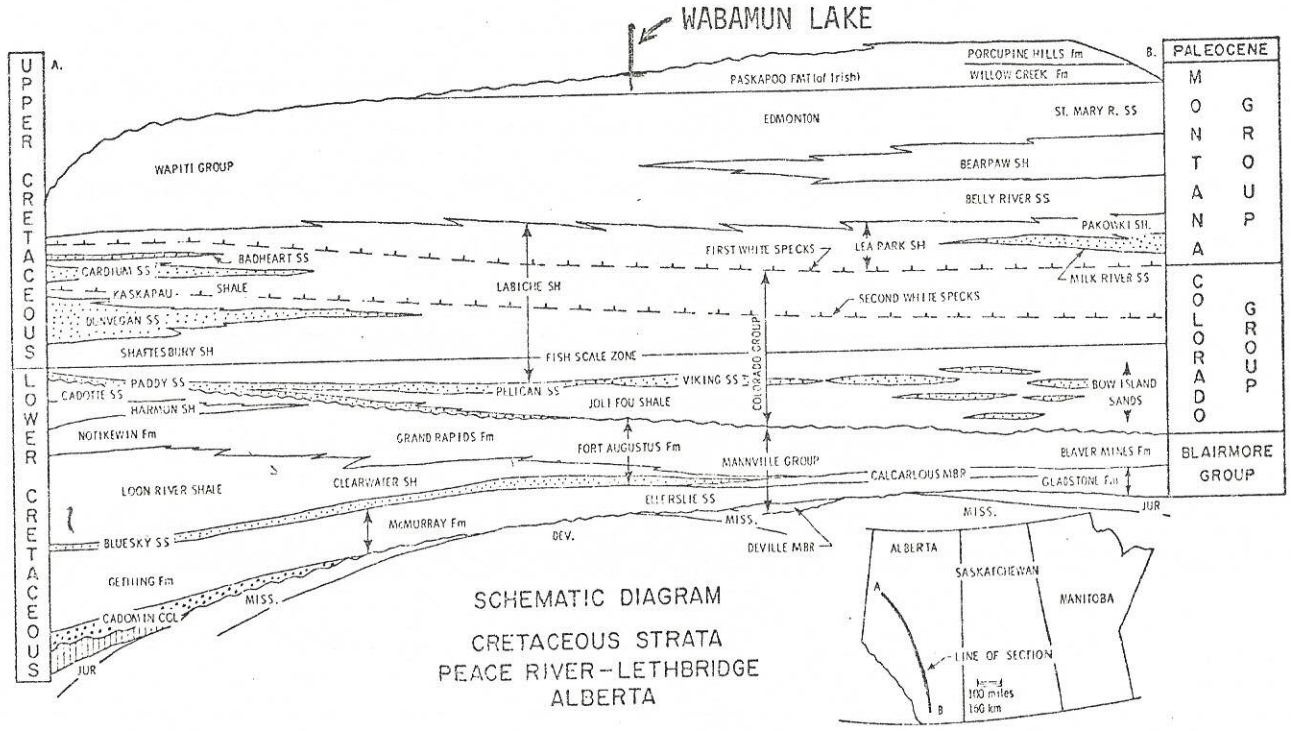
Coveney, J. W. and Brown, A. A., Geology and development history of the Acheson field; C.I.M.M. Bulletin, Vol. 47, No. 505, May, 1954, pp. 310-317.
Cudby, E. E., The Acheson field; C.I.M.M. Bulletin, Vol. 45, 1952, pp. 545-549.



Stratigraphic relation of members of the Edmonton Formation


WABAMUN LAKE
A.
B.
UPPER CRETACEOUS
LOWER CRETACEOUS
PALEOCENE
MONTANA GROUP
COLORADO GROUP
BLAIRMORE GROUP
PORCUPINE HILLS Fm
WILLOW CREEK Fm
PASKAPOO FMT (of Irish)
EDMONTON
ST. MARY R. SS
WAPITI GROUP
BEARPAW SH
BELLY RIVER SS
PAKOWKI SH.
FIRST WHITE SPECKS
LEA PARK SH
BADHEART SS
CARDIUM SS
KASKAPAU SHALE
DUNVEGAN SS
MILK RIVER SS
LABICHE SH
SECOND WHITE SPECKS
SHAFTESBURY SH
FISH SCALE ZONE
PADDY SS
CADOTTE SS
HARMON SH
PELICAN SS
VIKING SS
JOLI FOU SHALE
BOW ISLAND SANDS
NOTIKEWIN Fm
GRAND RAPIDS Fm
FORT AUGUSTUS Fm
MANNVILLE GROUP
BLAIRMORE Fm
CALCAREOUS MBR
GLADSTONE Fm
LOON RIVER SHALE
CLEARWATER SH
ELLERSLIE SS
McMURRAY Fm
BLUESKY SS
DEV.
MISS.
DEVILLE MBR
JUR
GETHING Fm
CADOMIN COL
SCHEMATIC DIAGRAM
CRETACEOUS STRATA
PEACE RIVER – LETHBRIDGE
ALBERTA
ALBERTA
SASKATCHEWAN
MANITOBA
LINE OF SECTION
100 miles
160 km

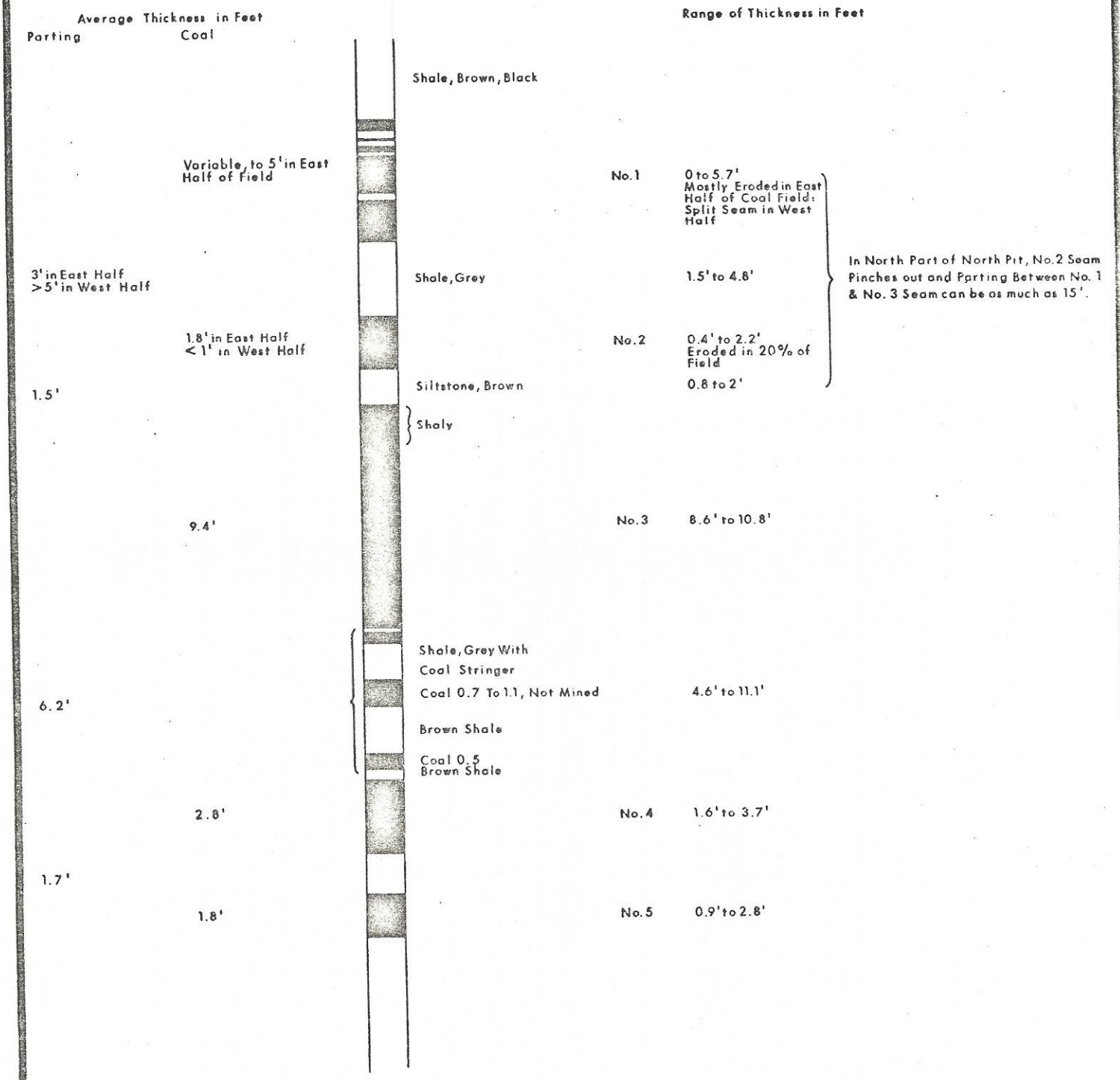


Figure 6

CALGARY ALBERTA CANADA

NORTH WABAMUN COAL FIELD

TYPICAL SECTION OF

COAL MEASURES

IN TWP. 53 RGE. 4 W. 5 M.