

Data compilation of the 1972 field party, southeast Brooks Range and Fort Yukon, Alaska; Vol 2

Furer, L.C., and Amoco Oil Co.

GMC DATA REPORT 465

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State of Alaska
Department of Natural Resources
Division of Geological & Geophysical Surveys
GEOLOGIC MATERIALS CENTER





Amoco Production Company
Denver Division

AREA Northern Alaska

STATE Alaska

COUNTY Brooks Range & Ft. Yukon Basin

JUL 27 1974

CF7 4: 0014

SUBJECT Data Compilation of the 1971 and 1972 Field Work,
Southeast Brooks Range and Fort Yukon Basin

Denver Division Memo No. 172

Date February, 1974

By L. C. Furer, R. H. Fehlman, A. M. Taylor, G. W. Self

NO. Volume I

ENCLOSURES

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CVMS



92-00663724-010



Amoco Production Company

February 20, 1974

CF74 0230

Mr. E. E. LaFaye
Building

Re: Denver Division Memo No. 172

Transmitted herewith is Denver Division Memo No. 172, "Data Compilation of the 1971 and 1972 Field Work, Southeast Brooks Range and Fort Yukon, Alaska" by L. C. Furer et. al.

This memo contains the basic field data collected by Amoco - Union geologists in 1971 and 1972. Copies of basic data has been previously transmitted to Union Oil along with attached written reports. Results of the 1971 and 1972 field work has also been reviewed with the Canadian Division on two occasions.

Since the area of this field work is located south of the Union - Amoco agreement area, Union does not receive Amoco's interpretation. Amoco's interpretation of the two years of field work will be presented in Denver Division Report No. 123.

The stratigraphic information accumulated by these field parties has developed time stratigraphic information essential for analysis of future seismic and drilling operations in the area. Favorable reservoir and source rocks occur on the north, east and south flanks of the basin. Specific recommendation for exploration in the basin will be included in Denver Division Report No. 123.

Very truly yours,


Terry Cooper

TC:CLC:prb

cc of report: District
G. O.
U. D.

Approved for transmittal:


E. E. LaFaye

FEBRUARY, 1974

Denver Division Geological
Memorandum No. 172
"Data Compilation of the 1971
and 1972 Field Work, Southeast
Brooks Range and Fort Yukon Basin"

Authors: L. C. Furer
R. H. Fehlman
A. M. Taylor
G. W. Self

Special Assistance by:
A. R. Ormiston
H. R. Lane

INTRODUCTION

This memo contains two volumes of basic field data, one collected in 1971 and the other in 1972. An interpretation and discussion of this data is contained in Denver Division Report No. 123. The data has been transmitted to Union Oil Co. of California along with written reports included as Attachments 1 and 2. Personnel for each field party is listed in the Attachments along with a brief discussion of methods and results of the field work.

ENCLOSURES (Volume I - 1971)

Figure 1 - Control Index Map (topographic)
Figure 1A - Control Index Map (topographic)
Figure 1B - Control Index Map (topographic)
Figure 1C - Control Index Map (topographic)
Appendix

A.* Measured Sections (yellow circles = barren, red circles = data) (Southeast Brooks Range)

1. Angry Bee Creek
2. Aspen Creek
3. Crow Nest Creek
4. Flat Rock Creek
5. Joe Creek
6. East Red Sheep Creek
7. North Red Sheep Creek
8. South Red Sheep Creek
9. Smoke Creek
10. Upper Coleen River
11. Upper Firth River
12. Wind River

*Sample Log Symbol Index: F is megafossil, C is conodont, f is foram, L is lithology, P is palynology, Sr is source rock, G is Geochron.

Porcupine River Area

13. Amoco J
14. Canalaska Mountain
15. Coleen River
16. Composite Mississippian (Rock Slough)
17. Fort Creek
18. Linear Ridge
19. Oolite Creek
20. Repetition Ridge
21. Salmontrout River
22. Type Salmontrout
23. Salmon Village
24. South Old Camp

Yukon River Area

25. Cabin Creek
26. Calico Bluff
27. Hardluck
28. Jones Ridge Composite
29. Limestone Hogback
30. McCann Hill
31. Mouth Tindir Creek
32. Nation
33. Step Mountain
34. Sta. 106
35. Sta. 134

- B. Paleontology Data
- C. Palynology Data
- D. Source Rock Data
- E. Geochronology Data
- F. X-ray Data
- G. Sample Lists
- H. Field Notes
- I. Photographs
- J. Porosity-Permeability Data

ENCLOSURES (Volume II - 1972)

Figure 1 - Control Index Map (topographic)
Figure 1A - Control Index Map (topographic)
Figure 1B - Control Index Map (topographic)
Figure 1C - Control Index Map (topographic)
Appendix

- A. Measured Sections with Paleontology.
(Southeast Brooks Range)

1. Angry Bee Creek
2. July Ninth
3. Mississippian on Neruokpuk
4. Nichenthran Mountain
5. Old John Lake
6. Savinkviayak River
7. Total Eclipse
8. Upper Wind River
9. West Wind River
10. Your Creek

(Porcupine - Yukon Rivers)

11. Biederman Bluff
12. Deacon Rock
13. Deacon Rock West
14. John Herbert Village
15. Keenan Quartzite
16. Mouth Coleen River
17. Nelsen Bluff
18. North Salmon Village
19. Rock Slough (Sta. 16)
20. Steamboat Mountain
21. Tacoma Bluff
22. Triassic Oil
23. Woodchopper Limestone

(South of Ft. Yukon Basin)

24. East Crazy Mountain
25. Fossil Mountain
26. North Schwatka
27. West Crazy Mountain
28. Windy Gap North
29. Windy Gap South

B. Paleontology - Megafossils, Conodonts and Forams

C. Palynology

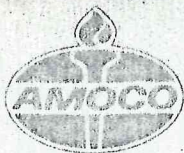
D. Source Rock Analysis

E. Radiometric Dates

F. Photographs

G. Sample Index

H. Field Notes



Attachment 2

Amoco Production Company
Denver Division

AREA FT. YUKON BASIN
STATE ALASKA
COUNTY _____

SUBJECT DATA COMPILATION OF THE 1972 FIELD PARTY - SE
BROOKS RANGE AND FT. YUKON BASIN

No. _____
Date JANUARY 24, 1974
By L. C. FURER

<u>NO.</u>	<u>ENCLOSURES</u>	<u>SCALE</u>
FIGURE 1	Topographic Index Maps	
FIGURE 1A	Topographic Index Maps	
FIGURE 1B	Topographic Index Maps	
FIGURE 1C	Topographic Index Maps	
ENCL. A	Measured Sections	
ENCL. B	Paleontology - Megafossils, Conodonts, & Forams	
ENCL. C	Palynology	
ENCL. D	Source Rock Analyses	
ENCL. E	Radiometric Dates	
ENCL. F	Photographs	
ENCL. G	Sample Index	
ENCL. H	Field Notes	

INTRODUCTION

The field work in 1972 was designed in part to supplement that of 1971 in the Southeast Brooks Range and along the Porcupine River. In addition, data was collected along the south margin of the Fort Yukon Basin west of Circle so that facies could be better extended across the basin. The data from this report should be used to amend the information submitted in last year's report.

The month-long field party operated out of small villages using a Fairchild-Hiller FH-1100. The party consisted of the following personnel:

Lloyd Furer - Party Chief
Andrew Taylor - Geologist
Tom DeKeyser (summer employee) - Paleontologist
Fred Hankinson (Union Oil) - Geologist
Allen Ormiston (first two weeks) - Paleontologist
Gordon Henderson (first two weeks) - Geologist
Glenn Wheeler - Pilot, Arctic Air Service
John Sullivan - Mechanic, Arctic Air Service

A total of 36,800 feet of section was measured at 29 localities, and an additional 140 grab collections were made. A total of 603 samples were collected, half of which contained megafossils.

Paleontologic studies used in this report were made by A. R. Ormiston (megafossils), H. R. Lane (conodonts) and D. W. Engelhardt (palynology and megaf flora).

Working out of small villages rather than tent camps proved to be much less expensive and is recommended for future work where possible.

STRATIGRAPHY AND DISCUSSION

The stratigraphy, as it was known after field work in 1971, is shown on Enclosure 2 of last year's report. References to "South of the Fort Yukon Basin" means that area west of Circle, Alaska on the south flank of the basin.

CAMBRIAN

No rocks of definite Cambrian age were found in the area south of the Fort Yukon Basin. An effort was made to find the Oldhamia-bearing sandstones and shales reported by Churkin (1970), but without success.

Mertie (1937) reports a sequence of clastic rocks south of the White Mountains which are probably in part Cambrian.

Cambrian rocks may also be present in a northeast-southwest band from Noodor Dome to Livengood Dome in the Livengood quadrangle as mapped by Chapman et al (1971).

ORDOVICIAN

The bulk of the rocks in the White Mountains are Ordovician as is probably true of most of Unit "A" of Mertie (1937), south of the White Mountains. Graptolitic Ordovician shales are also present west of Livengood at locality 8804.

The sequence in the White Mountains grades upwards from shale (Unit "A") to volcanic conglomerates and sandstones (Fossil Creek Volcanics) to thin coral reefs within the upper part of the conglomerate, overlain by shallow shelf limestones (Tolovana Limestone).

Ordovician carbonates were also measured at Deacon Rock on the Porcupine River and at Steamboat Mountain in the Porcupine Uplands (Black River Quad) where they had been mapped as Precambrian by the U.S. Geological Survey.

The Ordovician section at Deacon Rock is structurally complex and is lithologically similar to the Ordovician sandstones and carbonates of the nearby Amoco "J" section measured in 1971.

Slightly metamorphosed dark limestones bearing Ordovician conodonts have been found at 1971 localities FCH641 and 6245 in the Southeast Brooks Range. This is the first report of rocks older than Silurian in the southern part of the Southeastern Brooks Range. This limestone should be included in the Neruokpuk Formation.

SILURIAN

The only known Silurian rocks south of the Fort Yukon Basin is the upper part of the Tolovana Limestone in the White Mountains. Equivalent age limestone may be present in the lowest part of the East Crazy Mountain section. If this is the case, then the Late Silurian is most likely shale and mudstone which is poorly exposed as in the East Crazy Mountain section.

DEVONIAN

Early Devonian Salmontrout reefal limestones were found at three new localities - Nelsen Bluff, Woodchopper and Deacon Rock. The 600-foot section at Deacon Rock ranges in age from Late Silurian to Early Devonian. This Salmontrout Reef differs from the type section in being essentially barren of shelly fossils. The main reef builders at Deacon Rock are corals, bryozoans and stromatoporoids. The thin section of Salmontrout Limestone exposed at Nelsen Bluff is most likely in the lagoonal facies.

At Woodchopper, the Woodchopper Limestone was examined and found to be Early rather than Middle Devonian. It is composed of coral and stromatoporoid class which may have been derived from an adjacent intrabasinal reef much like the one at Deacon Rock.

Only two outcrops of late Early Devonian rocks were found south of the Fort Yukon Basin - one in East Crazy Mountains and at a grab locality, T12N-R8E, between the Crazy Mountains and Mt. Schwatka. Carbonate is exposed at both localities and overlies a shale section which may also be Early Devonian. Also at Mt. Schwatka a shale section underlies Middle Devonian carbonates and is most likely Early Devonian.

At least 800 feet of Middle Devonian reefal limestone is present at North Mt. Schwatka. The upper part of this section, above an obvious fault, is also reefal and may be Late Devonian.

Late Devonian rocks could not be found along the Porcupine River.

Additional sections of Late Devonian reefs and clastics were measured west of Arctic Village in the Brooks Range. Also, Middle Devonian nearshore sandstones were found to exist between the Neruokpuk and Kayak Shale at the Total Eclipse section (T5S-R37E). Equivalent sandstone and conglomerate is interpreted to be present beneath the Kayak at North Red Sheep Creek.

MISSISSIPPIAN

No rocks of Mississippian age could be found south of the Fort Yukon Basin. If Mississippian rocks are present, they are probably thin, poorly exposed shales. The U.S. Geological Survey has found that most of the Mississippian rocks reported in this area by Mertie are in fact Permian. Mississippian rocks were examined at John Herbert Village on the Porcupine River, and also in poor exposures south of the Porcupine River in this area.

PENNSYLVANIAN

No Pennsylvanian rocks were found south of the Fort Yukon Basin. As is the case with the Mississippian, they probably occur as thin, poorly exposed shales. Possibly the Pennsylvanian and Mississippian have been removed by post-Pennsylvanian erosion.

PERMIAN

We could find no paleontologic evidence that Permian rocks exist south of the Fort Yukon Basin; however, the U.S. Geological Survey reports a probable Permian age for the Ramparts Group on the Yukon River. This unit is very similar to the Circle Volcanics and it is likely that both units are Permian. Mainly, these units are composed of basalts, shales and cherts with minor amounts of calcareous siltstones and sandstones. Volcanics and/or intrusives predominate in the Circle Volcanics.

TRIASSIC-JURASSIC

No sedimentary rocks of definite Triassic or Jurassic age are known south of the Fort Yukon Basin. A part of the Ramparts/Circle complex may be Triassic and does include probable Triassic intrusives.

The oil shale part (Late Triassic) of the Glenn Shale was measured on the southwest bank of the Yukon River. Here it is at least 500 feet thick and contains abundant radiolarians. It is oil stained and analyses give yields of 1.7-6.7 gallons per ton. Jurassic shales were found at Section 36-11N-27E between Bear Mountain and Step Mountain and at latitude 67°35' North, longitude 145°8' West, south of Arctic Village. Possible Jurassic shales also occur at T15N-R26E near Bear Mountain.

CRETACEOUS

Rocks of definite Cretaceous age were not examined south of the Fort Yukon Basin. They probably occur about 35 miles southwest of Livengood as reported by the U.S. Geological Survey.

Cretaceous coarse clastics are probably present from Bear Mountain to Biederman Bluff north of the Yukon River. Early Cretaceous beach-bar sandstones (Keenan Sandstone) are exposed in T11N-R27E and nearby localities. Along the Yukon River the Keenan is overlain by a thick sequence of turbidites - the Biederman Argillite and Kathul Graywacke.

TERTIARY

A thick sequence of Miocene rocks is present at the southwest edge of the Fort Yukon Basin. This non-marine sequence of conglomerate, sandstone, siltstone and coal overlies the Ramparts Group unconformably. Tertiary may also be present in T11N-R11E south of the Fort Yukon Basin. There is no paleontologic evidence to support this statement.

Late Tertiary (Miocene?) coarse clastics are also present at two localities at the east end of the Fort Yukon Basin (T14N-R22E and T17N-R21E). One of these localities was mapped as Precambrian by the U.S. Geological Survey.