

SOCIETY MOBIL OIL OF CANADA, LTD.

GEOLOGICAL FIELD PARTY 22, 1962

**SOUTHERN MACKENZIE MOUNTAINS
and the**

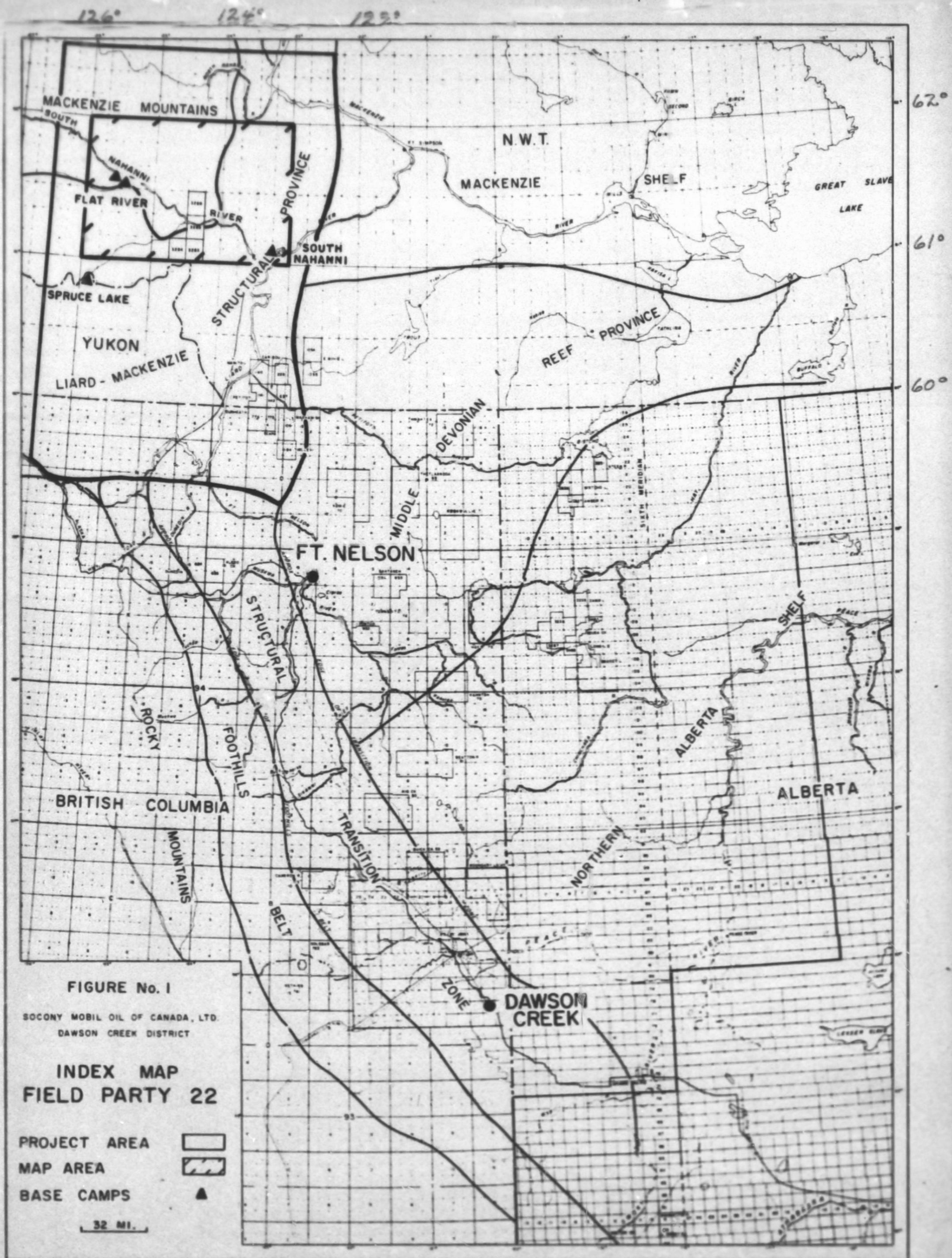
LIARD PLATEAU AREA

YUKON AND NORTHWEST TERRITORIES

H. W. VRYHEID

DAWSON CREEK, B.C.

October, 1963.



INTRODUCTION

The following pages comprise a report concerning the activities of Socony Mobil Oil Field Party #22 which spent the 1962 field season in the Southern Mackenzie Mountains, and the Liard Plateau area between $122^{\circ} 30'$ and $126^{\circ} 30'$ of longitude and between $59^{\circ} 30'$ and $62^{\circ} 30'$ of latitude. Field Party 22, which was composed of five geologists, was designed to obtain stratigraphic and structural information in the Liard Plateau area. The total cost of the exploration of the Field Party was \$90,773.30.

FIELD WORK

The field work in the area was accomplished with the aid of a Bell Super G helicopter for field transport, and by a fixed wing aircraft supplement. During the 91 days from June 1st to August 30th, that the party was in the field only 40 days were available for work, the remainder being lost due to inclement weather, particularly during the month of August when only five days could be worked. Due to the continuing bad weather, the majority of the work effort was concentrated on the stratigraphy of the Middle Devonian to Ordovician sediments which are exposed in the Mackenzie Mountains. Mapping of structures in the Liard Plateau was not performed. Upon return of the Field Party to the office, all samples of measured sections were logged by microscope.

The geological map included in this report is based on measured sections, spot samples and data from air photographs. Faulting is shown only where contacts of dissimilar rocks are evident.

The area described in this report has an areal extent of approximately 30,000 square miles. Four wells have been drilled in the project area.

Pan Am. Beaver River d-73-K found a reported 700 feet of gas pay in the Middle Devonian Arnica formation. S.O.B.C. Beavercrow YT No. 1 was abandoned at a total depth of 13,045 feet and after drilling 8,435 feet carbonate rock. The Pan Am. A-1 Mattson was abandoned at a depth of 10,890 feet after drilling 9,230 feet of carbonate rock. Porosity encountered in this well was water bearing.

OFFICE WORK

Upon return of the Field Party to the office, all samples of measured sections were logged by microscope. Since the close of the field season, emphasis has been placed on lithological analysis with most of the lithological specimens collected in the field being re-examined.

STRATIGRAPHY

Introduction

The composite thickness of sediments of Ordovician to Middle Devonian age, mostly carbonate rocks, measured in the southern Mackenzie Mountains is 11,740 feet. The oldest beds located at Virginia Falls, in the western portion of the map sheet, were dated by the Geological Survey of Canada to be of Ordovician age. The base of these beds is not exposed and, therefore, their total thickness is not known. No formal names have been proposed for the rock units in the South Nahanni River area, however formational names have been proposed for the Camell Bend and Root River areas by the G.S.C. These names are used in this report. A difference in correlation of the youngest Middle Devonian formations makes it necessary to introduce a new name for the limestones exposed in the Ram and Nahanni Plateaus. The name "Ram formation" is introduced.

The Stratigraphic Correlation Chart, indicates the relative positions of

	SOUTH NAHANNI		NORMAN WELLS	HORN PLATEAU	B.C. PLAIN	LIARD PLATEAU
	THIS REPORT	G.S.C.				
MIDDLE DEVONIAN and / or LOWER DEVONIAN	RAM		KEE SCARP	HORN PLATEAU	SLAVE POINT	HORN RIVER
	FUNERAL		HARE INDIAN	HORN RIVER	MUSKEG	
	NAHANNI	NAHANNI	HUME	NAHANNI	KEG RIVER	
	MANETOE	HEADLESS	BEAR ROCK	CHINCHAGA	CHINCHAGA	
	ARNICA	FUNERAL MANETOE ARNICA	LONE MTN.	BEAR ROCK	RED BEDS PRE - CAMBRIAN and QUARTZITE	ARNICA ?
SILURIAN	CLEARWATER SOMBRE TUNDRA	SOMBRE	RONNING CAMBRIAN	RONNING	FIG. No. 2 STRATIGRAPHIC CORRELATION CHART SOUTH NAHANNI & ADJACENT AREAS	
ORDOVICIAN	SUNBLOOD	SUNBLOOD				

formations in the South Nahanni River and adjoining area. The locations of the measured sections are shown on the Surface Geological map. A composite stratigraphic section is included.

ORDOVICIAN

Sunblood Formation

The type section for the Sunblood formation is at the south side of Sunblood Mountain above the Virginia Falls. The Sunblood was measured by Field Party 22 at this locality and is shown in Section D 11-E 1 (lat. $61^{\circ} 39'$, Long. $125^{\circ} 45'$). The base of the section, in the canyon of the South Nahanni River, could not be measured due to the high water level. The contact with older beds is not exposed and it is, therefore, uncertain if Cambrian beds underlie the Sunblood at this location. The top of the Sunblood formation is placed at the base of the first massive dolomite bed. The thickness measured in this section is 2,520 feet.

The Sunblood formation consists of thinly bedded, argillaceous, crypto-crystalline, fossiliferous limestone with occasional thick to massive limestone beds. Thin beds of calcareous shale are present throughout the section and form recessive zones in outcrop. The weathered surface is heavily iron stained, the red and yellow colouring giving the formation its name. The fossil content is high, particularly near the top of the section. The fossils consist of brachiopods, bryozoans and a few corals.

The Sunblood formation outcrops over a large area in the western part of the map area, on Sunblood Range and Sunblood Plateau and on fault blocks in the Caribou, May and Funeral Ranges, as shown on the Geological Map.

The Sunblood formation is known only in the Virginia Falls area. Fossils from the type location are of Middle Ordovician age as determined by the G.S.C.

SILURIAN

Clearwater Formation

The type section for this formation is the northern slope of Sunblood Mountain. It was measured in detail and is shown on Section D 11-E 1. The base of the formation is placed at the first occurrence of dolomite above the thinly bedded limestones of the Sunblood formation. In this Section (D 11-E 1) the top is an unconformity, as the overlying beds are the porous dolomites of the Lower or Middle Devonian Arnica formation. The thickness measured is 2,250 feet.

This formation consists of medium bedded to massive, blocky weathering, medium to dark grey, silty to sandy limestone with shale intervals and several dolomite beds. In general, the topographic expression is recessive and outcrops are poor. The dolomite beds are concentrated near the top and the bottom of the formation, while the shale zones occur in the middle. In the western portion of the map area, the shales form a minor part; however, laterally to the southwest along the South Nahanni River, the amount of shale increases at the expense of the carbonate.

The Clearwater formation outcrops in the western part of the Virginia Falls area and has the same areal distribution as the Sunblood formation. A partial section was measured on May Range in the southwest portion of the Virginia Falls area and is shown on Section R 11-R 12. The thickness measured was 1,560 feet consisting mainly of argillaceous dark grey to

dark brown limestone with shale and dolomite bands.

Tundra Formation

The Tundra formation is defined at Tundra Ridge to the west of Nahanni Plateau and is demonstrated on Section R 25-D 9 (lat. $61^{\circ} 52'$, Long. $124^{\circ} 52'$).

The base of the formation is placed at the first occurrence of dolomite above thinly bedded limestone correlated with the Sunblood formation. The top is a gradational contact and has been placed arbitrarily at the highest sampled limestone bed.

The Tundra formation consists of interbedded limestone and dolomite with minor siltstone beds. The limestone is light to medium grey brown, micro to cryptocrystalline and silty. Few organic remains are present. The dolomite is light grey to brown, micro to cryptocrystalline with good to fair vuggy porosity. The siltstone has a yellow colour and is in part sandy. The general exposure of this formation is rubbly and bedding is therefore indistinct.

The Tundra formation can be recognized only on Tundra Ridge.

The Tundra formation is considered to be the equivalent of the basal part of the Clearwater formation and although no definite correlation has been made, it appears that both formations overlie the Sunblood formation.

Sombre Formation

The type section for the Sombre formation is on the Tundra Ridge and is shown on Section R 25-D 9. The base is a gradual contact, with the top

of the formation being placed at the first occurrence of silt and sand in the dolomite, the overlying dolomites of the Arnica formation being clean.

The Sombre formation consists of microcrystalline, light to medium grey dolomite which is argillaceous and silty in the lower 850 feet and contains beds of siltstone and sandstone in the upper part. Vuggy porosity is common, mainly in the cleaner dolomite zones. The silt and sand content of the formation decreases in a southerly direction as illustrated in Section E-20 of the Meilleur Range area. In the eastern portion of the map area in the Nahanni Range, approximately 11 miles south of Little Doctor Lake, beds of coarse grained sand are interbedded with the silty and sandy dolomite.

This formation outcrops on Tundra Ridge and in Arnica Range, and on the east side of the Nahanni Range. It is also exposed in deep canyons in the Prairie Plateau area.

The Sombre formation has a wide areal distribution in the Yukon and Northwest Territories. It is equivalent of the Ronning formation of the Mackenzie Mountains where the thickness is reported by Harrison to vary from 850 feet to 4,050 feet.

LOWER OR MIDDLE DEVONIAN

Arnica Formation

The type section for the Arnica formation is taken at Tundra Ridge and shown on Section R 25-D 9. The base is marked by an influx of sandstone and siltstone and disseminated sand grains in the dolomite. The top of

the formation is placed at the base of a coarse crystalline dolomite or limestone of the Manetoe formation, forming a recessive, poorly exposed zone 80 to 100 feet in thickness.

The Arnica formation consists of medium and light grey, light to dark grey weathering, microcrystalline, clean dolomite with bands of fair to good vuggy porosity throughout the section. Bedding is thick to massive. In outcrop it has a banded appearance. The lithologic character of the Arnica formation is similar in all outcrops examined. Occasional discontinuous bands of white, coarse, vuggy dolomite are present which have the appearance of reefs. The thickness of these bands does not exceed five feet.

The Arnica formation outcrops over large areas in the Prairie Plateau and in the Ranges in the northern and southeastern part of the Virginia Falls area. On the Nahanni Range the Arnica outcrops along the crest and the eastern scarp. It is present in the Mattson and Beavercrew wells. The Arnica formation is a blanket type deposit covering the whole Liard Plateau area and the Southern Mackenzie Mountains. It is not present on the Sunblood Plateau.

The Arnica formation is non-fossiliferous and the age is uncertain. Dating is based on the relative position to formations of known age. It underlies the Middle Devonian Manetoe formation and overlies the Silurian Sombre formation, giving a Lower or possibly Middle Devonian age.

Manetoe Formation

The Manetoe formation is defined on the Arnica Range and is shown on Section D 7-R 18. The base is marked by the clean non-calcareous, microcrystalline dolomites of the Arnica formation. The top is placed at the

8

first occurrence of coarse crystalline dolomite or limestone underlying the cryptocrystalline limestone of the Nahanni formation. These contacts are often gradational and not well defined.

The Manetoe formation consists of coarse crystalline, non-fossiliferous limestone and dolomite in varying proportion. The colour is light to dark grey and a general brecciated appearance is common.

The Manetoe formation is present over most of the northern and southern part of the map. The formation shales out in a southerly direction as indicated on the geological map. Areas where shale-out can be observed are at the southern end of the Headless and Meilleur Ranges, and the south side of the Manetoe and Dall Ranges. Thickness of the formation varies from 490 feet at Nahanni Butte, to 170 feet in the First Canyon of the South Nahanni River.

No fossil evidence is available to establish the age of the Manetoe formation.

Nahanni Formation

The name Nahanni formation was proposed by Hage in 1945 for limestone forming the cap rock on Nahanni Butte. The lower contact is placed at the first occurrence of coarse crystalline dolomite and the upper contact is formed by the shales of the overlying Funeral Formation.

A complete section is measured on Arnica Range, Section D 7-R 18, where both the Upper and Lower contacts are present.

The Nahanni formation consists of dark to medium grey, micro to cryptocrystalline limestone with abundant fossil debris. The limestone is

first occurrence of coarse crystalline dolomite or limestone underlying the cryptocrystalline limestone of the Nahanni formation. These contacts are often gradational and not well defined.

The Manetoe formation consists of coarse crystalline, non-fossiliferous limestone and dolomite in varying proportion. The colour is light to dark grey and a general brecciated appearance is common.

The Manetoe formation is present over most of the northern and southern part of the map. The formation shales out in a southerly direction as indicated on the geological map. Areas where shale-out can be observed are at the southern end of the Headless and Meilleur Ranges, and the south side of the Manetoe and Dall Ranges. Thickness of the formation varies from 490 feet at Nahanni Butte, to 170 feet in the First Canyon of the South Nahanni River.

No fossil evidence is available to establish the age of the Manetoe formation.

Nahanni Formation

The name Nahanni formation was proposed by Hage in 1945 for limestone forming the cap rock on Nahanni Butte. The lower contact is placed at the first occurrence of coarse crystalline dolomite and the upper contact is formed by the shales of the overlying Funeral Formation.

A complete section is measured on Arnica Range, Section D 7-R 18, where both the Upper and Lower contacts are present.

The Nahanni formation consists of dark to medium grey, micro to cryptocrystalline limestone with abundant fossil debris. The limestone is

clean and only a minor amount of argillaceous material is present.

The Nahanni limestone is resistive to erosion and is a cliff former.

The Nahanni becomes shale to the south in the Headless and Meilleur Ranges, and on the Manetoe and Arnica Ranges.

The Nahanni formation outcrops over a wide area as the dip slope of the mountain ranges and as the flat lying upper beds in the Prairie Plateau. Only on the Arnica Range are top and bottom contacts exposed, the thickness there is 310 feet. At all other sections measured, the top of the Nahanni formation forms the present ground surface and some erosion has taken place. Thickest known section is in the First Canyon of the South Nahanni River where Section D 3-D 4 has 370 feet of limestone present.

The Nahanni formation is continuously present along the mountain front from Nahanni Butte to Norman Wells.

Funeral Formation

The type section for the Funeral formation is on Arnica Range and is shown on Section D 7-R 18. It is a shale unit overlying the Nahanni limestone and underlying the Ram limestone. The base and top are marked by the massive limestones of these formations.

The Funeral formation consists of dark grey to black, platy, calcareous, silty shale with thin beds of argillaceous limestone. The calcareous material increases towards the top where several thick resistant limestone beds are developed.

The Funeral formation outcrops in the northern part of the map area form-

ing steep scree slopes on the Ram and Nahanni Plateaus and the Sombre Mountains. Its southern extent is doubtful. Lithologically, the Funeral formation is a recognizable unit only when overlain by limestones of the Ram formation. Thickness of this formation on Arnica Range is 1,570 feet and thickens to 2,500 feet on the Nahanni Plateau, and is about 2,200 feet in thickness on the Ram Plateau.

Ram Formation

The Ram formation is defined on the Arnica Range and shown on Section D 7-A 18. This formation is a limestone unit bounded at the base by the shales of the Funeral formation and at the top by the shales of the Fort Simpson formation.

The Ram formation consists of dark grey, black argillaceous, micro to cryptocrystalline, fossiliferous limestone. The bedding is very irregular, varying from a few inches to massive. It forms a resistive zone between the two shale units.

The Ram formation forms the resistant flat-lying cap rock on the Ram and Nahanni Plateaus and the Sombre Mountains. The thickest known section is in the Northern Ram Plateau where approximately 800 feet is present. On the Arnica Range 450 feet were measured.

The Ram formation becomes shale to the south. The shale-out is gradual, the limestone becoming increasingly argillaceous and merges with the overlying and underlying shales.

The Ram formation is the youngest Devonian carbonate formation known in this area.

UPPER DEVONIAN AND YOUNGER FORMATIONS

Formations younger than the Ram formation were not examined by this Party, except for a section of Mattson sandstone measured on the north flank of the Tlogotsho Range.

STRUCTURE

The area covered by the Sibbeston Lake and Virginia Falls map sheet includes the following structural features tabulated from east to west. These features are shown on the Geological map.

Plains Area

This area is covered by glacial deposits and muskeg, and terminates abruptly to the west against the Liard and Nahanni Ranges.

Liard Ranges

Nahanni Range: This is a narrow, north-south trending mountain range with a width of four miles and a length of 80 some miles. The eastern limit is formed by a scarp 2,500 feet high with the western limit formed by the dip-slope of the resistive Nahanni formation. Structurally the Nahanni Range is a faulted anticline with the east flank moved down along the main thrust fault.

Silent Hills: These Hills and adjoining valleys are north-south trending features bounded by the dip-slopes of the Nahanni Range to the east and the Ram and Prairie Plateaus to the west. Structurally this area is a faulted syncline, the Silent Hills being the resistive sandstones of the Mattson formation outcropping in the axis of the syncline.

Yohin Ridge and Liard Range: These high and rugged ranges in the

southeast of the map have a southwest-northeast trend. The ranges are the expression of a syncline and anticline, and form the southern continuation of the Silent Hills.

Tlogotsho Range: This high Plateau is bounded on all sides by a low lying area formed by the Fort Simpson shales. It is a synclinal feature plunging to the southeast.

Ram Plateau: The Ram Plateau is a domal feature bounded to the east, north and west by the dip-slope of the Ram formation while to the south the boundary is formed by the shale-out of the resistive Ram limestones.

Mackenzie Mountains

Nahanni Plateau: The Nahanni Plateau is an anticlinal feature dipping to the east. The west flank is up-turned, caused by a major thrust fault to the west of the Tundra Ridge.

Prairie Plateau: This area is the southern continuation of the Nahanni Plateau. The Prairie Plateau is a south plunging anticline separated from the Nahanni Plateau by a northeast-southwest trending fault.

Tundra Ridge: The Tundra Ridge is a high mountain range formed by steeply east dipping beds. The western edge is formed by a fault scarp.

Headless Range and Meilleur Range: These two mountain ranges are fault blocks bounded on one side by the dip-slope of the Nahanni formation and on the opposite side by a fault.

Funeral Range: This mountain range is a fault block and the southern extension of the Vera Plateau.

Vera Plateau: This is an area of low hills, mostly tree-covered with a general dip to the south.

Manetoe Range: This range is the east flank of a syncline in the core of which Upper Devonian shale outcrop.

Arnica Range, Sombre Mountains and Sunblood Range: These mountain ranges surround a synclinal depression in which shales of the Upper Devonian Fort Simpson formation are preserved.

May Range and Caribou Range: These ranges are fault blocks on which Sunblood and Clearwater formations outcrop.

Sunsblood Plateau: This is an area of flat lying limestone beds of the Sunblood and Clearwater formations.

Liard Plateau: No detailed structural or stratigraphic investigations were made in this area.

OIL AND GAS POSSIBILITIES

The study of the stratigraphy has indicated that porous reservoir rocks can be expected in the subsurface of the Liard Plateau. The main reservoir is the dolomite section of the Arnica formation which has fair to good vuggy porosity in all outcrop sections examined. In addition, wildcat wells drilled in the area indicate the Arnica formation is porous, indicating this formation to be a blanket type deposit, and that entrapment of oil and gas is dependent on structural control.

BIBLIOGRAPHY

R. J. W. Douglas and
D. K. Norris

1960: Virginia Falls and Sibbeston Lake
Map areas, Northwest Territories
G.S.C. Paper 60-19.

1961: Camsell Bend and Root River Map areas,
Northwest Territories G.S.C. Paper
61-13.

1959: Fort Liard and La Biche Map areas,
Northwest Territories and Yukon,
G.S.C. Paper 59-6.

J. Harrison

1956: Geology of the North and South
Nahanni Rivers area, Northwest
Territories, Report for Mobil Oil
of Canada, Ltd.

D. J. McLaren

1962: Middle and early Upper Devonian
Rhynchonelloid Brachiopods from
Western Canada. G.S.C. Bulletin
86.

H. R. Belyea

1962: Middle Devonian and older
Palaeozoic formations of Southern
District of Mackenzie and adjacent
areas. G.S.C. Paper 62-15.

H. G. Bassett

1960: Devonian stratigraphy, Central
Mackenzie River Region, Northwest
Territories, Canada Geology of
the Arctic, Volume 1.

P. Harker

1961: Summary account of Carboniferous
and Permian formations, south-
western District of Mackenzie.
G.S.C. Paper 61-1.

the western part of
and on fault blocks
the Geological Map.

The Clearwater formation outcrops in the western part of the Virginia Falls area and has the same areal distribution as the Sunblood formation. A partial section was measured on May Range in the southwest portion of the Virginia Falls area and is shown on Section R 11-R 12. The thickness measured was 1,560 feet consisting mainly of argillaceous dark gray to

The Tundra formation is considered to be the equivalent of the basal part of the Clearwater formation and although no definite correlation has been made, it appears that both formations overlie the Sunblood formation.

The type section for the Sombre formation is on the Tundra Ridge and is shown on Section R 25-D 9. The base is a gradual contact, with the top

The Sombre formation has a wide areal distribution in the Yukon Territories. It is equivalent of the Renning formation of the Mountains where the thickness is reported by Harrison to vary from 1,000 feet to 4,050 feet.

Arnica Formation

The type section for the Arctica formation is taken at Tundra River shown on Section R 25-D 9. The base is marked by an influx of sandstone and siltstone and disseminated sand grains in the dolomite. The

UNIT	SURFACE FEATURES	THICKNESS	MICROSCOPIC DESCRIPTION		
			GRADE	ACC. SIZE	DESCRIPTION
MIDDLE DEVONIAN	370' +	0			Part cover 877, beds tanist. Blacky, cover
MIDDLE DEVONIAN	370' +	100			
MIDDLE DEVONIAN	370' +	200			
MIDDLE DEVONIAN	370' +	300			
MIDDLE DEVONIAN	370' +	400			
MIDDLE DEVONIAN	370' +	500			
MIDDLE DEVONIAN	370' +	600			
MIDDLE DEVONIAN	370' +	700			
MIDDLE DEVONIAN	370' +	800			

SILURIAN

WATER FORM.

EAR

good to fair vuggy porosity. The siltstone has a yellow colour and is in part sandy. The general exposure of this formation is rubbly and bedding is therefore indistinct.

The Tundra formation can be recognized only on Tundra Ridge.

The Tundra formation is considered to be the equivalent of the basal part of the Clearwater formation and although no definite correlation has been made, it appears that both formations overlies the Sunblood formation.

Sombre Formation

The type section for the Sombre formation is on the Tundra Ridge and is shown on Section R 25-D 9. The base is a gradual contact, with the top

the Prairie Plateau area.

The Sombre formation has a wide areal distribution in the Yukon and Northwest Territories. It is equivalent of the Ronning formation of the Mackenzie Mountains where the thickness is reported by Harrison to vary from 850 feet to 4,050 feet.

LOWER OR MIDDLE DEVONIAN

Arnica Formation

The type section for the Arnica formation is taken at Tundra Ridge and shown on Section R 25-D 9. The base is marked by an influx of sandstone and siltstone and disseminated sand grains in the dolomite. The top of

eastern scarp. It is present in the Mattson and Beavercrew wells. The Arnica formation is a blanket type deposit covering the whole Liard Plateau area and the Southern Mackenzie Mountains. It is not present on the Sunblood Plateau.

The Arnica formation is non-fossiliferous and the age is uncertain. Dating is based on the relative position to formations of known age. It underlies the Middle Devonian Manetoe formation and overlies the Silurian Sombre formation, giving a Lower or possibly Middle Devonian age.

Manetoe Formation

The Manetoe formation is defined on the Arnica Range and is shown on Section D 7-R 18. The base is marked by the clean non-calcareous, micro-crystalline dolomites of the Arnica formation. The top is placed at the

SILURIAN

CLEAR WATER FORM.

2250'

400	Lt grey. Thin-v thinly bedded. Fr small breache.	Dk grey. Rubbly.	Dk grey. Thin-v thinly bedded. Fr small breache.	Dk grey. Rubbly.
500	thickly bedded. Few qtz also infrequent.	Buff grey. Black.	thickly bedded. Few qtz also infrequent.	Buff grey. Black.
600	Poor exp. Grey, pink patches. Abt small breache.	Grey. Rubbly.	Poor exp. Grey, pink patches. Abt small breache.	Grey. Rubbly.
700	Grey. Few small breache. Rubbly.	Grey. Rubbly.	Grey. Few small breache. Rubbly.	Grey. Rubbly.
800	Grey v. thinly bedded. Platy & rubbly. Red hum.	Grey. Rubbly.	Grey v. thinly bedded. Platy & rubbly. Red hum.	Grey. Rubbly.
900	Grey & buff orange weath. Rubbly.	Grey. Rubbly.	Grey & buff orange weath. Rubbly.	Grey. Rubbly.
1000	Grey w/pink casts in pt. thin beds. Rubbly.	Grey. Rubbly.	Grey w/pink casts in pt. thin beds. Rubbly.	Grey. Rubbly.
1100	Grey w/red brn patches. Fr breache. Thin beds.	Grey. Rubbly.	Grey w/red brn patches. Fr breache. Thin beds.	Grey. Rubbly.
1200	As. Abt breache. Grey w/pink stain. V thin bedded.	Grey. Rubbly.	As. Abt breache. Grey w/pink stain. V thin bedded.	Grey. Rubbly.
1300	Grey w/man & red patches. Rubbly to trill frag.	Grey. Rubbly.	Grey w/man & red patches. Rubbly to trill frag.	Grey. Rubbly.
1400	Part cover. Grey w/red & tan patches. Thin-v	Grey. Rubbly.	Part cover. Grey w/red & tan patches. Thin-v	Grey. Rubbly.
1500	thin bedded. Platy-bloody.	Grey. Rubbly.	thin bedded. Platy-bloody.	Grey. Rubbly.
1600	Grey. Abt breache. Platy.	Grey. Rubbly.	Grey. Abt breache. Platy.	Grey. Rubbly.
1700	Grey-reddish. Bloody.	Grey. Rubbly.	Grey-reddish. Bloody.	Grey. Rubbly.
1800	Grey v. thin bedded. Few breache, tre. trilobites.	Grey. Rubbly.	Grey v. thin bedded. Few breache, tre. trilobites.	Grey. Rubbly.
1900	Platy.	Grey. Rubbly.	Platy.	Grey. Rubbly.
2000	Grey. Poorly exposed.	Grey. Rubbly.	Grey. Poorly exposed.	Grey. Rubbly.
2100	Grey rubbly. Poorly exposed.	Grey. Rubbly.	Grey rubbly. Poorly exposed.	Grey. Rubbly.
2200	Buff orange & grey. Rubbly.	Grey. Rubbly.	Buff orange & grey. Rubbly.	Grey. Rubbly.
2300	Buff & grey. Thinly bedded. Extensive drift.	Grey. Rubbly.	Buff & grey. Thinly bedded. Extensive drift.	Grey. Rubbly.
2400	Yell brn & grey. Platy.	Grey. Rubbly.	Yell brn & grey. Platy.	Grey. Rubbly.
2500	Buff brn. Extensive cover.	Grey. Rubbly.	Buff brn. Extensive cover.	Grey. Rubbly.
2600	Dk grey & some brn extensive cover.	Grey. Rubbly.	Dk grey & some brn extensive cover.	Grey. Rubbly.
2700	Lt grey. Bloody-rubbly. Extensive cover.	Grey. Rubbly.	Lt grey. Bloody-rubbly. Extensive cover.	Grey. Rubbly.
2800	W grey w/arg. stain. Beds 2'-3'. Bloody.	Grey. Rubbly.	W grey w/arg. stain. Beds 2'-3'. Bloody.	Grey. Rubbly.
2900	Dk grey, brn tinge. Beds 1'. Limestone 2'-3'.	Grey. Rubbly.	Dk grey, brn tinge. Beds 1'. Limestone 2'-3'.	Grey. Rubbly.
3000	W grey w/buff stain. Bedding non evid.	Grey. Rubbly.	W grey w/buff stain. Bedding non evid.	Grey. Rubbly.
3100	Apparent massive. Rubbly-bloody.	Grey. Rubbly.	Apparent massive. Rubbly-bloody.	Grey. Rubbly.
3200	Buff. Bed non evid. Shabby-rubbly.	Grey. Rubbly.	Buff. Bed non evid. Shabby-rubbly.	Grey. Rubbly.
	Dk grey w/buff. Beds 2'-3'. Bloody-slabby-rubbly.	Grey. Rubbly.	Dk grey w/buff. Beds 2'-3'. Bloody-slabby-rubbly.	Grey. Rubbly.
	Covered.	Grey. Rubbly.	Covered.	Grey. Rubbly.
	Lt grey w/buff stain. Imatin coarse. Rubbly-bloody.	Grey. Rubbly.	Lt grey w/buff stain. Imatin coarse. Rubbly-bloody.	Grey. Rubbly.
	Lt grey-buff. Limestone. No beds evid. Rubbly-slabby.	Grey. Rubbly.	Lt grey-buff. Limestone. No beds evid. Rubbly-slabby.	Grey. Rubbly.
	Buff-ore. Pinkish stain. As.	Grey. Rubbly.	Buff-ore. Pinkish stain. As.	Grey. Rubbly.
	Lt grey w/yell patches. As.	Grey. Rubbly.	Lt grey w/yell patches. As.	Grey. Rubbly.
	Covered.	Grey. Rubbly.	Covered.	Grey. Rubbly.
	Buff Bloody-rubbly.	Grey. Rubbly.	Buff Bloody-rubbly.	Grey. Rubbly.
	Lt grey. Beds 6'-8'. Bloody.	Grey. Rubbly.	Lt grey. Beds 6'-8'. Bloody.	Grey. Rubbly.
	W grey w/buff cont. In situ septe.	Grey. Rubbly.	W grey w/buff cont. In situ septe.	Grey. Rubbly.
	As. Rubbly.	Grey. Rubbly.	As. Rubbly.	Grey. Rubbly.
	Lt grey-buff. Beds 4'-5'. Bloody.	Grey. Rubbly.	Lt grey-buff. Beds 4'-5'. Bloody.	Grey. Rubbly.
	Lt grey buff. V massive. Bloody.	Grey. Rubbly.	Lt grey buff. V massive. Bloody.	Grey. Rubbly.
	Lt grey buff. Beds 4'-5'. Bloody.	Grey. Rubbly.	Lt grey buff. Beds 4'-5'. Bloody.	Grey. Rubbly.
	Yell buff. Beds 3'-4'. Bloody-rubbly.	Grey. Rubbly.	Yell buff. Beds 3'-4'. Bloody-rubbly.	Grey. Rubbly.
	W grey. Beds 1'-3'. As.	Grey. Rubbly.	W grey. Beds 1'-3'. As.	Grey. Rubbly.
	Yell-buff. Beds 1'-5'. Jointed. Bloody.	Grey. Rubbly.	Yell-buff. Beds 1'-5'. Jointed. Bloody.	Grey. Rubbly.
	W grey w/yell & buff patches. Beds 2' 1/2'. Bloody.	Grey. Rubbly.	W grey w/yell & buff patches. Beds 2' 1/2'. Bloody.	Grey. Rubbly.
	Covered.	Grey. Rubbly.	Covered.	Grey. Rubbly.
	Lt grey buff w/yell patches. Beds 1'-3'. Massive.	Grey. Rubbly.	Lt grey buff w/yell patches. Beds 1'-3'. Massive.	Grey. Rubbly.
	Covered.	Grey. Rubbly.	Covered.	Grey. Rubbly.
	Buff. Beds 2'-3'. Bloody-slabby.	Grey. Rubbly.	Buff. Beds 2'-3'. Bloody-slabby.	Grey. Rubbly.
	Buff w/yell patches. Beds 1'-3'. Bloody-rubbly.	Grey. Rubbly.	Buff w/yell patches. Beds 1'-3'. Bloody-rubbly.	Grey. Rubbly.

formation is taken at Tundra Ridge and base is marked by an influx of sandstone and grains in the dolomite. The top of

The Manetoe formation is defined on the Arnica Range and is shown on Section D 7-R 18. The base is marked by the clean non-calcareous, micro-crystalline dolomites of the Arnica formation. The top is placed at the

The Mahanni formation consists of dark to medium grey, micro to cryptocrystalline limestone with abundant fossil debris. The limestone is

The Funeral formation outcrops in the northern



SUNBLOOD FORM. 2520

and is shown on
a-calcareous, micro-
p is placed at the

The Mahanni formation consists of dark to medium grey, micro to crypto-crystalline limestone with abundant fossil debris. The limestone is

The Funeral formation outcrops in the northern part of the map area form-



LOGGED BY A.R.W.

The Ren formation is the youngest Devonian carbonate formation known in this area.

Yohin Ridge and Liard Range: These high and rugged ranges in the

Headless Range and Meilleur Range: These two mountain fault blocks bounded on one side by the dip-slope of the formation and on the opposite side by a fault.

[illegible]

DEVONIAN

limit is formed by a scarp 2,500 feet high with the western
ed by the dip-slope of the resistive Nahanni formation.
ly the Nahanni Range is a faulted anticline with the east
d down along the main thrust fault.

st Hills: These Hills and adjoining valleys are north-south
features bounded by the dip-slopes of the Nahanni Range to
and the Ram and Prairie Plateaus to the west. Structurally
is a faulted syncline, the Silent Hills being the resistive
of the Mattson formation outcropping in the axis of the

Ridge and Liard Range: These high and rugged ranges in the

thrust fault to the west of the Tundra Ridge.

Prairie Plateau: This area is the southern continuation of the Nahanni Plateau. The Prairie Plateau is a south plunging anticline separated from the Nahanni Plateau by a northeast-southwest trending fault.

Tundra Ridge: The Tundra Ridge is a high mountain range formed by steeply east dipping beds. The western edge is formed by a fault scarp.

Headless Range and Meilleur Range: These two mountain ranges are fault blocks bounded on one side by the dip-slope of the Nahanni formation and on the opposite side by a fault.

the Sunblood and Clearwater formations.

Liard Plateau: No detailed structural or stratigraphic investigations were made in this area.

OIL AND GAS POSSIBILITIES

The study of the stratigraphy has indicated that porous reservoir rocks can be expected in the subsurface of the Liard Plateau. The main reservoir is the dolomite section of the Arnica formation which has fair to good vuggy porosity in all outcrop sections examined. In addition, wildcat wells drilled in the area indicate the Arnica formation is porous, indicating this formation to be a blanket type deposit, and that entrapment of oil and gas is dependent on structural control.

D. J. McLaren

H. R. Belyea

H. G. Bassett

+ 2530

Covered.
Basal 5', weath. lt. gray rubble.

LOGGED BY A.R.W.

is up-turned, caused by a major
Ridge.

the southern continuation of the
is a south plunging anticline
by a northeast-southwest trending

is a high mountain range formed by
tern edge is formed by a fault scarp.

These two mountain ranges are
the dip-slope of the Nahanni
by a fault.

Sunblood Plateau: This is an area of flat lying limestone beds of
the Sunblood and Clearwater formations.

Liard Plateau: No detailed structural or stratigraphic investiga-
tions were made in this area.

OIL AND GAS POSSIBILITIES

The study of the stratigraphy has indicated that porous reservoir rocks
can be expected in the subsurface of the Liard Plateau. The main
reservoir is the dolomite section of the Arnica formation which has fair
to good vuggy porosity in all outcrop sections examined. In addition,
wildcat wells drilled in the area indicate the Arnica formation is porous,
indicating this formation to be a blanket type deposit, and that entrapment
of oil and gas is dependent on structural control.

D. J. McLaren

H. R. Belyea

H. G. Bassett

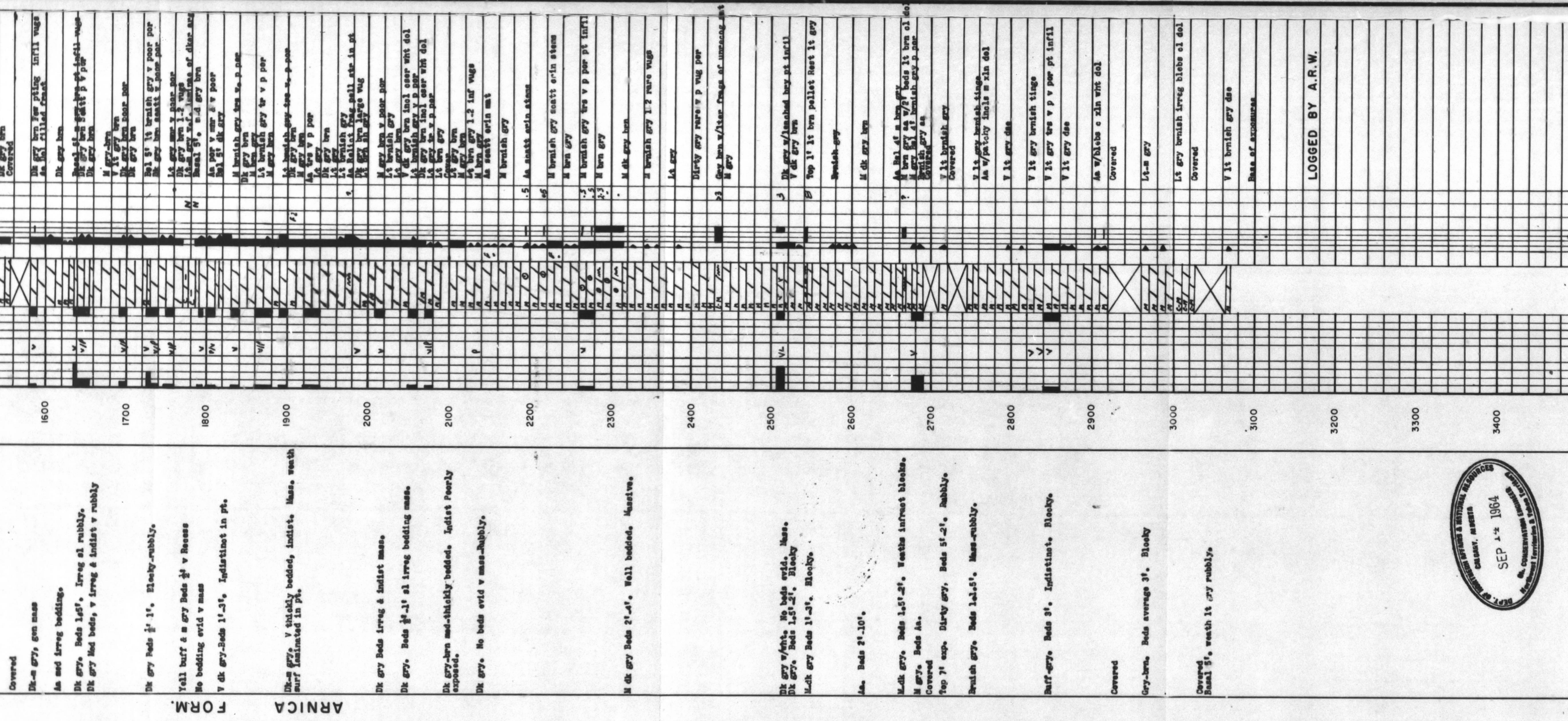
of Canada, Ltd.

1962: Middle and early Upper Devonian
Rhynchonelloid Brachiopods from
Western Canada. G.S.C. Bulletin
86.

1962: Middle Devonian and older
Palaeozoic formations of Southern
District of Mackenzie and adjacent
areas. G.S.C. Paper 62-15.

1960: Devonian stratigraphy, Central
Mackenzie River Region, Northwest
Territories, Canada Geology of
the Arctic, Volume 1.

KODAK SAFETY FILM



2112

57-1-5-31

FIELD PARTY 22, 1962

SOUTH NAHANNI RIVER AREA, N.W.T.

SECTION No., D3 - R4

LOCATION, Lat.: 61° 58' Long.: 123° 25'

NAHANNI RANGE AT CLI LAKE

STRATIGRAPHIC SEQUENCE: MIDDLE DEVONIAN NAHANNI FORMATION

TO

SILURIAN SOMBRE FORMATION

MEASURED THICKNESS: 3100'

SURFACE FEATURES

MICROSCOPIC DESCRIPTION

UNIT

THICKNESS

POROSIITY

GRADE

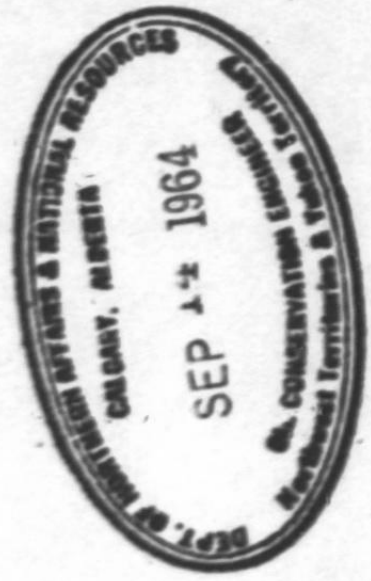
AMT. TYPE

LITHO

ACC. SIZE

N. S. FF

DESCRIPTION



- 1962: Middle and early Upper Devonian Rhynchonelloid Brachiopods from Western Canada. G.S.C. Bulletin 86.
- 1962: Middle Devonian and older Paleozoic formations of Southern District of Mackenzie and adjacent areas. G.S.C. Paper 62-15.
- 1960: Devonian stratigraphy, Central Mackenzie River Region, Northwest Territories, Canada Geology of the Arctic, Volume 1.

KODAK SAFETY FILM

2112

Mobil 57-1-5-31

FIELD PARTY 22, 1962

SOUTH NAHANNI RIVER AREA, N.W.T.

SECTION No., D3 - R4

LOCATION, Lat.: 61° 58' Long.: 123° 25'

NAHANNI RANGE AT CLI LAKE

STRATIGRAPHIC SEQUENCE: MIDDLE DEVONIAN NAHANNI FORMATION

TO

SILURIAN SOMBRE FORMATION

MEASURED THICKNESS: 3100'

UNIT	SURFACE FEATURES		MICROSCOPIC DESCRIPTION			
	THICKNESS	POROSITY	AMT. TYP. GRADE	LITHO. ACC. SIZE R. S.F.F.	DESCRIPTION	E
NAHANNI FORM. 270'	0				Lt gr buff. Beds 11-5'. Black. Some red pits. Med gr. Beds 11'. Black. Lithol. gr. Beds 11-5'. Black.	
	100				Covered.	
	200				Gr buff. Beds 11-5'. Black. Lt. Beds 11-5'. Covered.	
	300				Buff or lt gr. Beds 11-5'. Black. Lt gr. Beds 11-5'. Massive black.	
	400				Med gr. Beds 11-5'. Black. Lt gr. Beds 11-5'. Black.	
	500				Med gr. Beds 11-5'. Black. Lt gr. Beds 11-5'. Black.	
	600				Med gr. Beds 11-5'. Black. Lt gr. Beds 11-5'. Black.	
	700				Med gr. Beds 11-5'. Black. Lt gr. Beds 11-5'. Black.	
	800				Med gr. Beds 11-5'. Black. Lt gr. Beds 11-5'. Black.	
	900				Med gr. Beds 11-5'. Black. Lt gr. Beds 11-5'. Black.	
MANETON FM. 130'	1000				Med gr. Beds 11-5'. Black. Lt gr. Beds 11-5'. Black.	
	1100				Med gr. Beds 11-5'. Black. Lt gr. Beds 11-5'. Black.	
	1200				Med gr. Beds 11-5'. Black. Lt gr. Beds 11-5'. Black.	
	1300				Med gr. Beds 11-5'. Black. Lt gr. Beds 11-5'. Black.	
	1400				Med gr. Beds 11-5'. Black. Lt gr. Beds 11-5'. Black.	
	1500				Med gr. Beds 11-5'. Black. Lt gr. Beds 11-5'. Black.	
	1600				Med gr. Beds 11-5'. Black. Lt gr. Beds 11-5'. Black.	
	1700				Med gr. Beds 11-5'. Black. Lt gr. Beds 11-5'. Black.	
	1800				Med gr. Beds 11-5'. Black. Lt gr. Beds 11-5'. Black.	
	1900				Med gr. Beds 11-5'. Black. Lt gr. Beds 11-5'. Black.	

EVONIAN



FIELD PARTY 22

SOUTH NAHANNI RIVER AREA

SECTION No., D III

LOCATION, Lat.: 61° 39'

SUNBLOOD MOUNTAIN

STRATIGRAPHIC SEQUENCE: MIDDLE DEVONIAN

MEASURED THICKNESS: 5140'

SURFACE FEATURES

UNIT	SURFACE FEATURES		MICROSCOPIC DESCRIPTION			
	THICKNESS	POROSITY	AMT. TYP. GRADE	LITHO. ACC. SIZE R. S.F.F.	DESCRIPTION	E
MIDDLE DEVONIAN	370' +				Med gr. Beds 11-5'. Black. Lt gr. Beds 11-5'. Black.	
	400				Med gr. Beds 11-5'. Black. Lt gr. Beds 11-5'. Black.	
	450				Med gr. Beds 11-5'. Black. Lt gr. Beds 11-5'. Black.	
	500				Med gr. Beds 11-5'. Black. Lt gr. Beds 11-5'. Black.	
	550				Med gr. Beds 11-5'. Black. Lt gr. Beds 11-5'. Black.	
	600				Med gr. Beds 11-5'. Black. Lt gr. Beds 11-5'. Black.	
	650				Med gr. Beds 11-5'. Black. Lt gr. Beds 11-5'. Black.	
	700				Med gr. Beds 11-5'. Black. Lt gr. Beds 11-5'. Black.	
	750				Med gr. Beds 11-5'. Black. Lt gr. Beds 11-5'. Black.	
	800				Med gr. Beds 11-5'. Black. Lt gr. Beds 11-5'. Black.	
ARNICA FORM.	850				Med gr. Beds 11-5'. Black. Lt gr. Beds 11-5'. Black.	
	900				Med gr. Beds 11-5'. Black. Lt gr. Beds 11-5'. Black.	
	950				Med gr. Beds 11-5'. Black. Lt gr. Beds 11-5'. Black.	
	1000				Med gr. Beds 11-5'. Black. Lt gr. Beds 11-5'. Black.	
	1050				Med gr. Beds 11-5'. Black. Lt gr. Beds 11-5'. Black.	
	1100				Med gr. Beds 11-5'. Black. Lt gr. Beds 11-5'. Black.	
	1150				Med gr. Beds 11-5'. Black. Lt gr. Beds 11-5'. Black.	
	1200				Med gr. Beds 11-5'. Black. Lt gr. Beds 11-5'. Black.	
	1250				Med gr. Beds 11-5'. Black. Lt gr. Beds 11-5'. Black.	
	1300				Med gr. Beds 11-5'. Black. Lt gr. Beds 11-5'. Black.	

MEASURED THICKNESS: 5140'

SURFACE FEATURES

THICKNESS AT	UNIT	370' +	ARINCA FORM.	DEVRONIAN	MIDDLE	DEVRONIAN	370' +	UNIT	THICKNESS AT
0		Part cover gty, beds indist. Blacky. Cover							
100									
200									
300									
400									
500									
600									
700									
800									
900									
1000									
1200									
1300									
1400									
1500									
1600									
1700									
1800									
1900									
2000									
2100									
2200									
2300									
2400									
2500									

DEVRONIAN

SILURIAN

2250' CLEAR WATER FORM.

800	Very dk gty. Bed 6-10'. Blacky. Covered.	1000	Med gty. Massive. Buff-nd gty. Bed 10-12'. Blacky-crumbly. Buff-nd gty. Bed 12-14'. Blacky. Covered.	1200	Med-nd gty. Bed 6-10'. Buff patches. Blacky. Buff-nd gty. Bed 10-12'. Lower 6' is gty-buff. Blacky. Covered.	1400	Blacky. Buff. 14' dk gty. Bed 11-12'. Partly bedded. Blacky-crumbly. Covered.	1600	Blacky. Buff. 14' dk gty. Bed 11-12'. Partly bedded. Blacky-crumbly. Covered.	1800	Blacky. Buff. 14' dk gty. Bed 11-12'. Partly bedded. Blacky-crumbly. Covered.	2000	Blacky. Buff. 14' dk gty. Bed 11-12'. Partly bedded. Blacky-crumbly. Covered.	2200	Blacky. Buff. 14' dk gty. Bed 11-12'. Partly bedded. Blacky-crumbly. Covered.	2400	Blacky. Buff. 14' dk gty. Bed 11-12'. Partly bedded. Blacky-crumbly. Covered.	2600	Blacky. Buff. 14' dk gty. Bed 11-12'. Partly bedded. Blacky-crumbly. Covered.	2800	Blacky. Buff. 14' dk gty. Bed 11-12'. Partly bedded. Blacky-crumbly. Covered.	3000	Blacky. Buff. 14' dk gty. Bed 11-12'. Partly bedded. Blacky-crumbly. Covered.	3200	Blacky. Buff. 14' dk gty. Bed 11-12'. Partly bedded. Blacky-crumbly. Covered.	3400	Blacky. Buff. 14' dk gty. Bed 11-12'. Partly bedded. Blacky-crumbly. Covered.	3600	Blacky. Buff. 14' dk gty. Bed 11-12'. Partly bedded. Blacky-crumbly. Covered.
-----	--	------	--	------	--	------	---	------	---	------	---	------	---	------	---	------	---	------	---	------	---	------	---	------	---	------	---	------	---

DEVRONIAN

SILURIAN

165' + SOMBRE FORM.



Covered.
Lt dk grt. Bed indist. Fragments. Few fossils.
Grt-grt buff. Bed 2' 11' res. No res. Frag.
bed covered. In grt. y massive. Large patches
with white. Numerous thin stems & frags on surf.

Top 70' 50' covered. Lt med grt. Peely bedded
2' 11'. Numerous thin stems on surf. Frags
frag. with.
Lt dk grt. Bed 2' 11' res. No res. Frag.
bed covered. In grt. y massive. Large patches
with white. Numerous thin stems & frags on surf.

Med dk grt. Irreg bedding 10' 11'. Frag.
Lt dk grt. Bed 2' 11' res. No res. Frag.
bed covered. In grt. y massive. Large patches
with white. Numerous thin stems & frags on surf.

Grt-grt buff. Well bedded 3' 11'. Blacky.

Also several recesses del beds 2' 11'.
Grt-grt buff. Med-dark beds w/ 3' 11' shaly-silt
Grt-grt. Thick beds. See recess beds.
Med dk grt. Bed 2' 11' res. No res. Frag.
bed covered. In grt. y massive. Large patches
with white. Numerous thin stems & frags on surf.

Med grt-dk. Bed 1' 11'. Blacky.
Grt-grt buff. Unbedded beds 2' 11'. Few thin
recess interspersed near base.

Brnsh grt- tan. Mass. Highly jointed.
Med grt w/ buff patches. Unbedded bedding (1' 11').
Good contact with overlying unit.

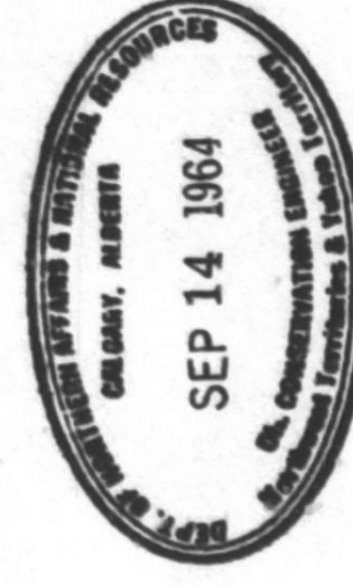
Covered.

Med grt w/ brnsh patches. Indist bedding. Bed
up to 5' 11' Mass.

Grt. Bed 5' 11'. Peely bedded. Mass.
Lt w/ interbeds of shaly-silt del.

Yell brn. Bed 1' 11'. Shaly-silt with.
Yell buff-grt. Bed 2' 11' w/ recess beds.
Med grt- buff. Even bedding (6'). 1' 11' interbeds
recess even del.

Lt grt-buff. Bed 3'. Basal 3' 11' weathers shaly-silt
11'.



LA. grt. Bed 2' 11'. Small post. Frag.
Covered. Prob much no unit below.

Med dk grt. Bed 2' 11'. Small post. Frag.
Covered. Prob much no unit below.

Med dk grt. Bed 2' 11'. Small post. Frag.
Covered. Prob much no unit below.

Med dk grt. Bed 2' 11'. Small post. Frag.
Covered. Prob much no unit below.

Med dk grt. Bed 2' 11'. Small post. Frag.
Covered. Prob much no unit below.

Med dk grt. Bed 2' 11'. Small post. Frag.
Covered. Prob much no unit below.

Med dk grt. Bed 2' 11'. Small post. Frag.
Covered. Prob much no unit below.

Med dk grt. Bed 2' 11'. Small post. Frag.
Covered. Prob much no unit below.

Med dk grt. Bed 2' 11'. Small post. Frag.
Covered. Prob much no unit below.

Med dk grt. Bed 2' 11'. Small post. Frag.
Covered. Prob much no unit below.

Med dk grt. Bed 2' 11'. Small post. Frag.
Covered. Prob much no unit below.

Med dk grt. Bed 2' 11'. Small post. Frag.
Covered. Prob much no unit below.

Med dk grt. Bed 2' 11'. Small post. Frag.
Covered. Prob much no unit below.

Med dk grt. Bed 2' 11'. Small post. Frag.
Covered. Prob much no unit below.

Med dk grt. Bed 2' 11'. Small post. Frag.
Covered. Prob much no unit below.

Med dk grt. Bed 2' 11'. Small post. Frag.
Covered. Prob much no unit below.

Med dk grt. Bed 2' 11'. Small post. Frag.
Covered. Prob much no unit below.

Med dk grt. Bed 2' 11'. Small post. Frag.
Covered. Prob much no unit below.

Med dk grt. Bed 2' 11'. Small post. Frag.
Covered. Prob much no unit below.

Med dk grt. Bed 2' 11'. Small post. Frag.
Covered. Prob much no unit below.

Med dk grt. Bed 2' 11'. Small post. Frag.
Covered. Prob much no unit below.

Med dk grt. Bed 2' 11'. Small post. Frag.
Covered. Prob much no unit below.

Med dk grt. Bed 2' 11'. Small post. Frag.
Covered. Prob much no unit below.

Med dk grt. Bed 2' 11'. Small post. Frag.
Covered. Prob much no unit below.

Med dk grt. Bed 2' 11'. Small post. Frag.
Covered. Prob much no unit below.

Med dk grt. Bed 2' 11'. Small post. Frag.
Covered. Prob much no unit below.

Med dk grt. Bed 2' 11'. Small post. Frag.
Covered. Prob much no unit below.

Med dk grt. Bed 2' 11'. Small post. Frag.
Covered. Prob much no unit below.

Med dk grt. Bed 2' 11'. Small post. Frag.
Covered. Prob much no unit below.

Med dk grt. Bed 2' 11'. Small post. Frag.
Covered. Prob much no unit below.

Med dk grt. Bed 2' 11'. Small post. Frag.
Covered. Prob much no unit below.

Med dk grt. Bed 2' 11'. Small post. Frag.
Covered. Prob much no unit below.

Med dk grt. Bed 2' 11'. Small post. Frag.
Covered. Prob much no unit below.

Med dk grt. Bed 2' 11'. Small post. Frag.
Covered. Prob much no unit below.

Med dk grt. Bed 2' 11'. Small post. Frag.
Covered. Prob much no unit below.

Med dk grt. Bed 2' 11'. Small post. Frag.
Covered. Prob much no unit below.

Med dk grt. Bed 2' 11'. Small post. Frag.
Covered. Prob much no unit below.

Med dk grt. Bed 2' 11'. Small post. Frag.
Covered. Prob much no unit below.

Med dk grt. Bed 2' 11'. Small post. Frag.
Covered. Prob much no unit below.

Med dk grt. Bed 2' 11'. Small post. Frag.
Covered. Prob much no unit below.



57-1-5-31

FIELD PARTY 22, 1962
SOUTH NAHANNI RIVER AREA, N.W.T.
SECTION No., E 20
LOCATION, Lat.: 61° 16' Long: 124° 50'
MEILLEUR RANGE
STRATIGRAPHIC SEQUENCE: MIDDLE DEVONIAN ARNICA FORMATION
TO
SILURIAN SOMBRE FORMATION

MEASURED THICKNESS: 3970'

UNIT	SURFACE FEATURES	MICROSCOPIC DESCRIPTION			
		THICKNESS	POROSITY	GRADE	DESCRIPTION
			AMT. TYP. GRADE	LITHO. ACC. TO	R 3 FF
ARNICA FORM. 2520' +	Lt-47 massive, dol. veins, rubbly weath.	0	100%	100%	100%
	Lt-47 massive, qtz veining	100	100%	100%	100%
	Lt-47 massive	200	100%	100%	100%
	Lt-47 massive, gray-black weathering	300	100%	100%	100%
	Lt-47 massive, gray-black weathering	400	100%	100%	100%
	Lt-47 massive, gray-black weathering	500	100%	100%	100%
	Lt-47 massive, gray-black weathering	600	100%	100%	100%
	Lt-47 massive, gray-black weathering	700	100%	100%	100%
	Lt-47 massive, gray-black weathering	800	100%	100%	100%
	Lt-47 massive, gray-black weathering	900	100%	100%	100%
DEVONIAN	Gray-brown, massive	1000	100%	100%	100%
	Gray-brown, massive	1100	100%	100%	100%
	Gray-brown, massive	1200	100%	100%	100%
	Gray-brown, massive	1300	100%	100%	100%
	Gray-brown, massive	1400	100%	100%	100%
	Gray-brown, massive	1500	100%	100%	100%
	Gray-brown, massive	1600	100%	100%	100%
	Gray-brown, massive	1700	100%	100%	100%
	Gray-brown, massive	1800	100%	100%	100%
	Gray-brown, massive	1900	100%	100%	100%

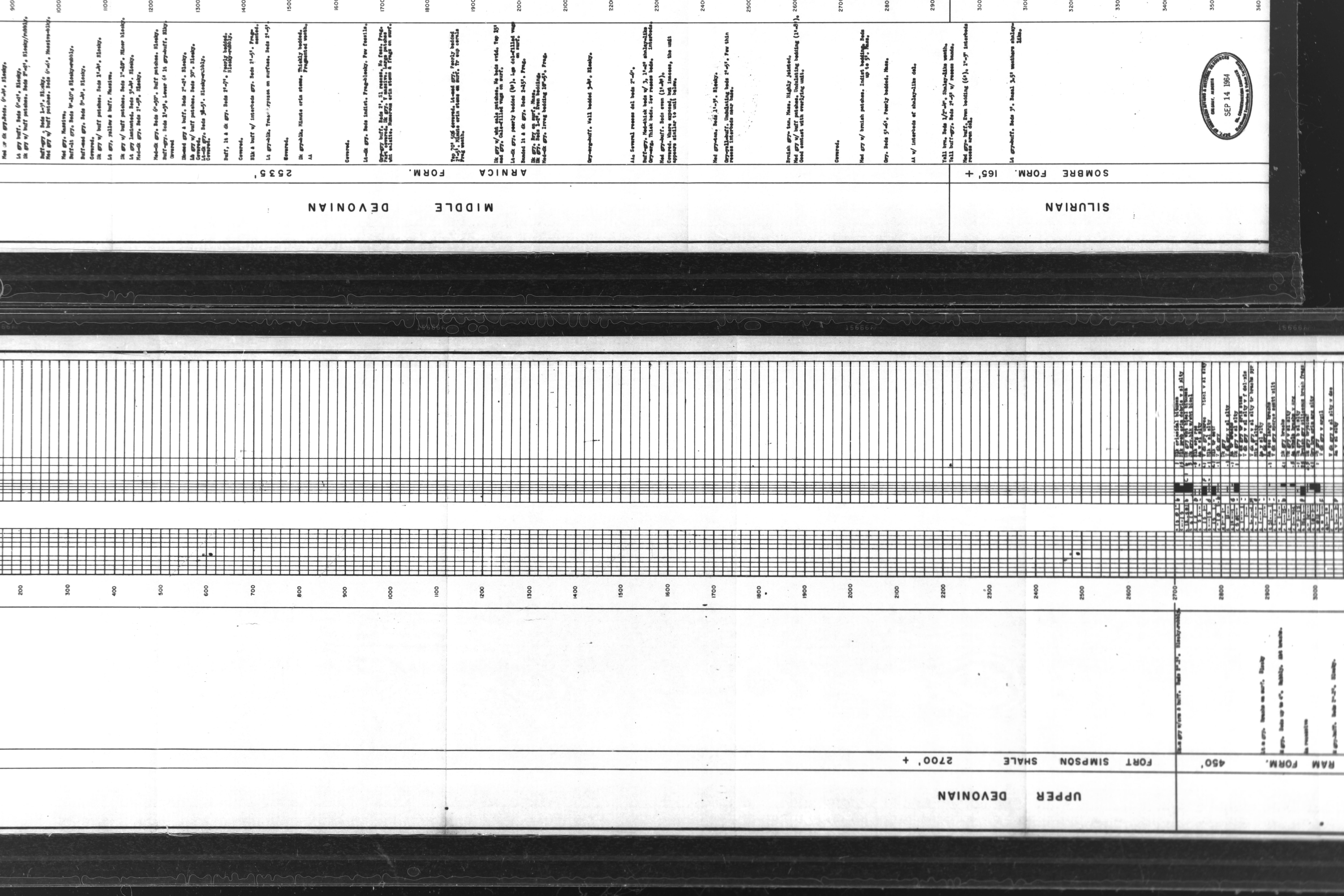


FIELD PARTY
SOUTH NAHANNI RIVER
SECTION No., C
LOCATION, Lat.: 61° 17'
FIRST CANYON OF SOUTH NAHANNI RIVER
STRATIGRAPHIC SEQUENCE:

MEASURED THICKNESS: 3070'

UNIT	SURFACE FEATURES	MICROSCOPIC DESCRIPTION			
		THICKNESS	POROSITY	GRADE	DESCRIPTION
			AMT. TYP. GRADE	LITHO. ACC. TO	R 3 FF
MANETOE FM. 170' +	Lt-47 massive, dol. veins, rubbly weath.	0	100%	100%	100%
	Lt-47 massive, qtz veining	100	100%	100%	100%
	Lt-47 massive	200	100%	100%	100%
	Lt-47 massive, gray-black weathering	300	100%	100%	100%
	Lt-47 massive, gray-black weathering	400	100%	100%	100%
	Lt-47 massive, gray-black weathering	500	100%	100%	100%
	Lt-47 massive, gray-black weathering	600	100%	100%	100%
	Lt-47 massive, gray-black weathering	700	100%	100%	100%
	Lt-47 massive, gray-black weathering	800	100%	100%	100%
	Lt-47 massive, gray-black weathering	900	100%	100%	100%
NAHANNI FORM. 370' +	Lt-47 massive, dol. veins, rubbly weath.	1000	100%	100%	100%
	Lt-47 massive, qtz veining	1100	100%	100%	100%
	Lt-47 massive	1200	100%	100%	100%
	Lt-47 massive, gray-black weathering	1300	100%	100%	100%
	Lt-47 massive, gray-black weathering	1400	100%	100%	100%
	Lt-47 massive, gray-black weathering	1500	100%	100%	100%
	Lt-47 massive, gray-black weathering	1600	100%	100%	100%
	Lt-47 massive, gray-black weathering	1700	100%	100%	100%
	Lt-47 massive, gray-black weathering	1800	100%	100%	100%
	Lt-47 massive, gray-black weathering	1900	100%	100%	100%

Lt grey. Poor exposure. Massive.



SILURIAN

SOMBRE FORM. 165' +

Brush grey tan, base, highly jointed,
red grey w/ buff patches. Underlying bedding (10.00%), 2000
Good contact with overlying unit.

Comments:

Red gray of brownish patches. Inlet bedding, beds up to 3' thick.

Gry. beds 5° - 40° , poorly bedded. Mass.

AA w/ intervertebral disc disease.

Tall brn. beds $1/2$ in. thick, shaly-like with
Tall buff-gr. beds 10 in. w/ rhyolite beds.

Red gyps. buff. Even bedding (6'), 2'-3" intervals
roots are det.

in gray-buff. beds 3'. basal 2-5" weather shaly-
like.

2048

0000

0063

1000

0005

0026

3900

3400

0055

0075

[illegible]

MIDDLE

FORM.

2790'

[illegible]

[illegible]

SILURIAN

SOMBRE FORM. 1450' +

Lt grey-brn. Massive

Lt grey. Poor exposure. Massive.

Lt grey-brn. Massive. Weathers grey. Poor exposures.

Covered

Lt grey-brn, pink in part. Massive. Weathers grey.





FIELD PARTY 2

SOUTH NAHANNI RIVER

COMPOSITE STRATIGRAPHIC

STRATIGRAPHIC SEQUENCE : U

ORDO

MEASURED THICKNESS : 14.44

SURFACE FEATURES

SILURIAN

TUNDRA FORM.		SOMBRE FORM.		2475	
11,500	Dark grey w/pebbled surface. An. v massive. No bedding evident.	11,500	Top 10'. Buff v thin bedding. Basal 11' dk grey rest. Not thin bedding where discernable. Extremely rubbly.	11,500	Top 10'. Buff v thin bedding. Basal 11' dk grey rest. Not thin bedding where discernable. Extremely rubbly.
11,400	Dark grey. Bedding indistinct.	11,400	Dark grey. Rubbly. Grey. Bedding indistinct.	11,400	Dark grey. Rubbly. Grey. Bedding indistinct.
11,300	Dark grey. Bedding indistinct.	11,300	Dark grey. Rubbly. Grey. Bedding indistinct.	11,300	Dark grey. Rubbly. Grey. Bedding indistinct.
11,200	Dark grey. Bedding indistinct.	11,200	Dark grey. Rubbly. Grey. Bedding indistinct.	11,200	Dark grey. Rubbly. Grey. Bedding indistinct.
11,100	Dark grey. Bedding indistinct.	11,100	Dark grey. Rubbly. Grey. Bedding indistinct.	11,100	Dark grey. Rubbly. Grey. Bedding indistinct.
11,000	Dark grey. Bedding indistinct.	11,000	Dark grey. Rubbly. Grey. Bedding indistinct.	11,000	Dark grey. Rubbly. Grey. Bedding indistinct.
10,900	Dark grey. Bedding indistinct.	10,900	Dark grey. Rubbly. Grey. Bedding indistinct.	10,900	Dark grey. Rubbly. Grey. Bedding indistinct.
10,800	Dark grey. Bedding indistinct.	10,800	Dark grey. Rubbly. Grey. Bedding indistinct.	10,800	Dark grey. Rubbly. Grey. Bedding indistinct.
10,700	Dark grey. Bedding indistinct.	10,700	Dark grey. Rubbly. Grey. Bedding indistinct.	10,700	Dark grey. Rubbly. Grey. Bedding indistinct.
10,600	Dark grey. Bedding indistinct.	10,600	Dark grey. Rubbly. Grey. Bedding indistinct.	10,600	Dark grey. Rubbly. Grey. Bedding indistinct.
10,500	Dark grey. Bedding indistinct.	10,500	Dark grey. Rubbly. Grey. Bedding indistinct.	10,500	Dark grey. Rubbly. Grey. Bedding indistinct.
10,400	Dark grey. Bedding indistinct.	10,400	Dark grey. Rubbly. Grey. Bedding indistinct.	10,400	Dark grey. Rubbly. Grey. Bedding indistinct.
10,300	Dark grey. Bedding indistinct.	10,300	Dark grey. Rubbly. Grey. Bedding indistinct.	10,300	Dark grey. Rubbly. Grey. Bedding indistinct.
10,200	Dark grey. Bedding indistinct.	10,200	Dark grey. Rubbly. Grey. Bedding indistinct.	10,200	Dark grey. Rubbly. Grey. Bedding indistinct.
10,100	Dark grey. Bedding indistinct.	10,100	Dark grey. Rubbly. Grey. Bedding indistinct.	10,100	Dark grey. Rubbly. Grey. Bedding indistinct.
10,000	Dark grey. Bedding indistinct.	10,000	Dark grey. Rubbly. Grey. Bedding indistinct.	10,000	Dark grey. Rubbly. Grey. Bedding indistinct.
9,900	Dark grey. Bedding indistinct.	9,900	Dark grey. Rubbly. Grey. Bedding indistinct.	9,900	Dark grey. Rubbly. Grey. Bedding indistinct.
9,800	Dark grey. Bedding indistinct.	9,800	Dark grey. Rubbly. Grey. Bedding indistinct.	9,800	Dark grey. Rubbly. Grey. Bedding indistinct.
9,700	Dark grey. Bedding indistinct.	9,700	Dark grey. Rubbly. Grey. Bedding indistinct.	9,700	Dark grey. Rubbly. Grey. Bedding indistinct.
9,600	Dark grey. Bedding indistinct.	9,600	Dark grey. Rubbly. Grey. Bedding indistinct.	9,600	Dark grey. Rubbly. Grey. Bedding indistinct.
9,500	Dark grey. Bedding indistinct.	9,500	Dark grey. Rubbly. Grey. Bedding indistinct.	9,500	Dark grey. Rubbly. Grey. Bedding indistinct.
9,400	Dark grey. Bedding indistinct.	9,400	Dark grey. Rubbly. Grey. Bedding indistinct.	9,400	Dark grey. Rubbly. Grey. Bedding indistinct.
9,300	Dark grey. Bedding indistinct.	9,300	Dark grey. Rubbly. Grey. Bedding indistinct.	9,300	Dark grey. Rubbly. Grey. Bedding indistinct.
9,200	Dark grey. Bedding indistinct.	9,200	Dark grey. Rubbly. Grey. Bedding indistinct.	9,200	Dark grey. Rubbly. Grey. Bedding indistinct.
9,100	Dark grey. Bedding indistinct.	9,100	Dark grey. Rubbly. Grey. Bedding indistinct.	9,100	Dark grey. Rubbly. Grey. Bedding indistinct.
9,000	Dark grey. Bedding indistinct.	9,000	Dark grey. Rubbly. Grey. Bedding indistinct.	9,000	Dark grey. Rubbly. Grey. Bedding indistinct.
8,900	Dark grey. Bedding indistinct.	8,900	Dark grey. Rubbly. Grey. Bedding indistinct.	8,900	Dark grey. Rubbly. Grey. Bedding indistinct.

[illegible]

FIELD PART

SOUTH NAHANNI R

COMPOSITE STR

STRATIGRAPHIC SEQUENCE

MEASURED THICKNESS : 14

SURFACE FEATURES

SUNBLOOD FORM.

Blank ledger page with columns for date, description, and amount.



DESCRIPTION

9

100

200

300

400

500

600

700

800

900

1000

1100

1200

1300

1400

1500

16091

1700

1800

19061

2002

2013

+ .0

[illegible]

[illegible]

Leau Area

KODAK SAFETY FILM

3100	buffy grey, beds 2'-4", clay-stability.	Dark grey at clay line up
3400	Very wavy buff, beds less than 4", limestone on top, thin clay matrix.	Limestone
3500		
3600		
3700		
3800		
3900		
4000		
4100		
4200		
4300		
4400		
4500		
4600		
4700		
4800		
4900		
5000		
5100		
5200		
5300		
5400		
5500		
5600		
5700		
5800		
5900		
6000		
6100		
6200		
6300		
6400		
6500		
6600		
6700		
6800		
6900		
7000		

MIDDLE DEVONIAN

7100		
7200		
7300		
7400		
7500		
7600		
7700		
7800		
7900		
8000		
8100		
8200		
8300		
8400		
8500		
8600		
8700		
8800		
8900		
9000		
9100		
9200		
9300		
9400		
9500		
9600		
9700		
9800		
9900		
10000		

MIDDLE
DEVONIAN

ARNICA FORM. 2680 +

ARNICA

LOGGED BY A.R.W.

NATIONAL INTELLIGENCE ARCHIVES & REFERENCE RESOURCES
CALGARY, ALBERTA
SEP 14 1964
U.S. CONGRESSIONAL INFORMATION SYSTEM
Executive Committee & Staff

LOGGED BY A.R.W.

$$\begin{array}{r} 11920 \\ 9000 \\ \hline 2920 \end{array}$$

SILURIAN

TUNDRA FORM. 1355'

[illegible]

LOGGED BY A.R.W.

MIDDLE DEVONIAN

ARNICA FORM.

[illegible]



FIELD PARTY 22, 1962

SOUTH NAHANNI RIVER AREA, N.W.T.

SECTION No., R 11 - R 12

LOCATION, Lat.: 61° 17' Long: 125° 20'

MAY RANGE

STRATIGRAPHIC SEQUENCE: SILURIAN CLEARWATER FORMATION

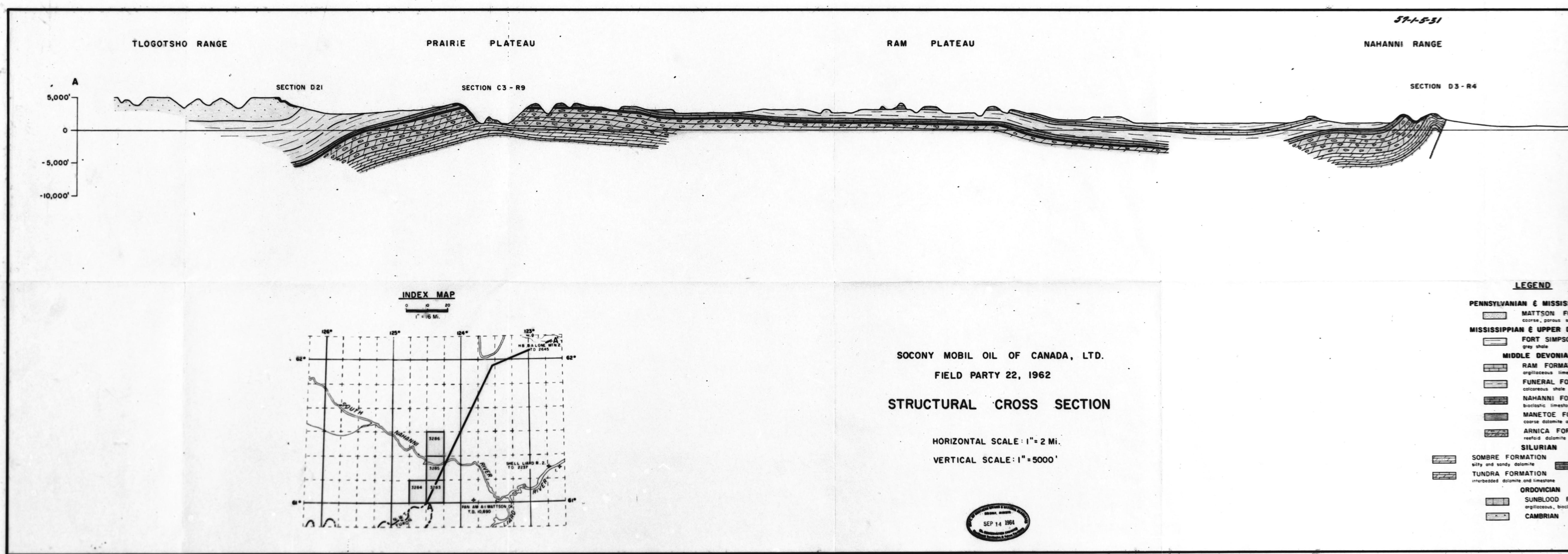
TO

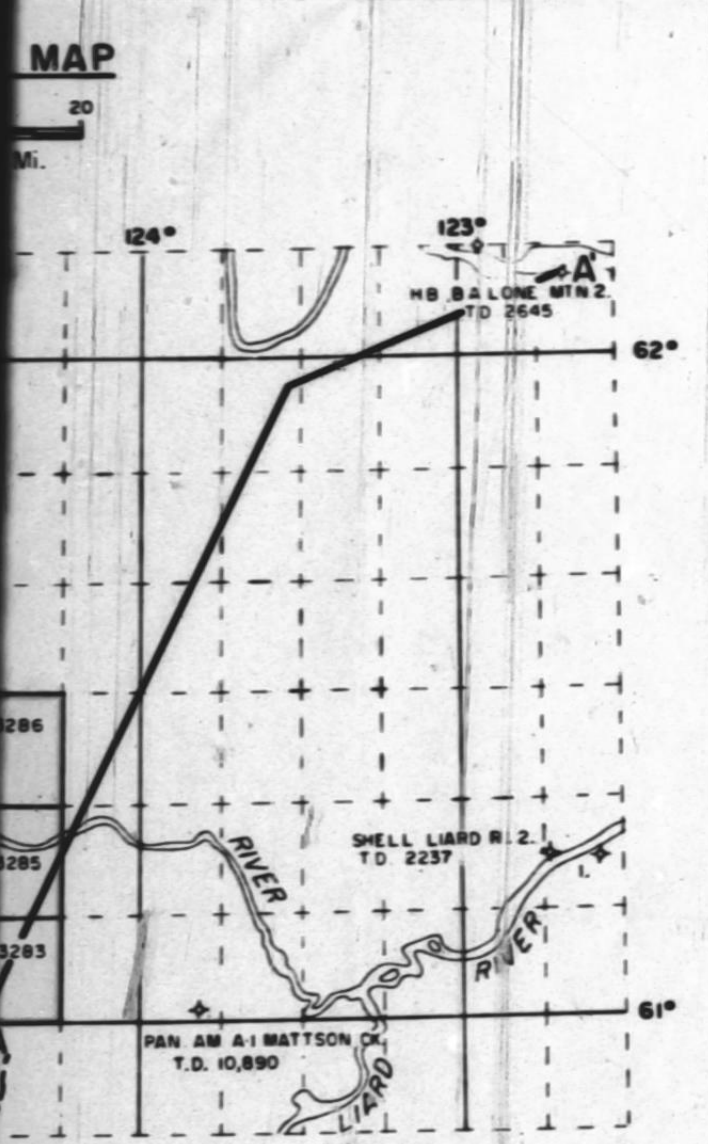
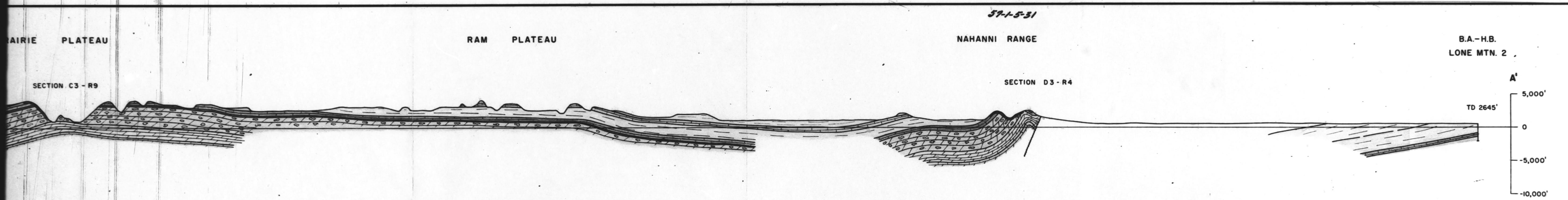
ORDOVICIAN SUNBLOOD FORMATION

MEASURED THICKNESS: 2170'

UNIT	SURFACE FEATURES	MICROSCOPIC DESCRIPTION			
		THICKNESS	POROSITY	LITHO.	DESCRIPTION
SILURIAN CLEARWATER FORMATION 1560' +		0			buff cry. Beds 1'-4". Platy. Top 4' platy. Rest cry w/ tan patches beds 1'-8". Bottom up
		100			dk yell buff platy-shaly bedded. Interst. aren. Md. cry. Prob thinly bedded.
		200			Top 5' dk yell buff. Highly jointed. Rest 15 cry beds 2'-5". Few thin platy aren.
		300			cry w/ tan patches. Beds 2'-4". Shaly-shale in pt. shaly.
		400			in platy. dk cry w/ patches buff & orange. "avy bedding 2'-4". shaly breaks up.
		500			dk cry & dk yell buff beds 2'-4". Jointed. dk cry-tan. Beds 2'-3.5". Poorly bedded. Jointed. shaly.
		600			cry & tan. Beds 2'-5". Bedding destroyed by frost & jointing in pt. Blocky-rubby.
		700			cry w/ tan patches. Beds 2'-4". Rubby. dk yell buff & lt cry. Beds 8"-12". Blocky cry & dk yell buff. No beds erid dol. becomes ls along dip.
		800			dk cry w/ dk yell buff patches. Fract & jointing destroys bedding. ls.
		900			Yell tan highly broken up. Prob thinly bedded.
		1000			dk cry beds 1.2'. Column coral @ base. cry tan w/ orange patches. Beds 2'-3.5". Rubby rounded weath surfaces.
		1100			dk cry w/ orange patches. Beds 2'-3.5". Fragmental jagged weathering.
		1200			dk cry w/ tan patches. Bedding indistinct, gen v massive w/ few beds up to 5" being discernable. Fragmental nature of outcrop makes it difficult to secure a fresh surface. Jagged weathering.
		1300			tan w/ yell patches. Beds approx 1 1/2'. Indist. cry tan. Beds indist. w/ few beds up to 5" being discernable. Jagged weath.
ORDOVICIAN SUNBLOOD FORMATION 610' +		1400			tan 2'-3' beds erid w/ even bedding
		1500			tan w/ yell patches. Beds approx 1 1/2'. Indist. cry tan. Beds indist. w/ few beds up to 5" being discernable. Jagged weath.
		1600			tan 2'-3' beds erid w/ even bedding
		1700			tan 2'-3' beds erid w/ even bedding
		1800			tan 2'-3' beds erid w/ even bedding
		1900			tan 2'-3' beds erid w/ even bedding
		2000			tan 2'-3' beds erid w/ even bedding
		2100			tan 2'-3' beds erid w/ even bedding
		2200			tan 2'-3' beds erid w/ even bedding
		2300			tan 2'-3' beds erid w/ even bedding
					tan 2'-3' beds erid w/ even bedding
					tan 2'-3' beds erid w/ even bedding
					tan 2'-3' beds erid w/ even bedding
					tan 2'-3' beds erid w/ even bedding
					tan 2'-3' beds erid w/ even bedding







SOCONY MOBIL OIL OF CANADA, LTD.
FIELD PARTY 22, 1962

STRUCTURAL CROSS SECTION

HORIZONTAL SCALE: 1" = 2 MI.
VERTICAL SCALE: 1" = 5000'



- LEGEND**
- PENNSYLVANIAN & MISSISSIPPIAN**
 - MATTSON FORMATION: coarse, porous sandstone
 - MISSISSIPPIAN & UPPER DEVONIAN: FORT SIMPSON SHALE: gray shale
 - MIDDLE DEVONIAN**
 - RAM FORMATION: argillaceous limestone
 - FUNERAL FORMATION: calcareous shale
 - NAHANNI FORMATION: bioclastic limestone
 - MANETOE FORMATION: coarse dolomite and limestone
 - ARNICA FORMATION: reefoid dolomite
 - SILURIAN**
 - SOMBRE FORMATION: silty and sandy dolomite
 - TUNDRA FORMATION: interbedded dolomite and limestone
 - CLEARWATER FORMATION: limestone with shale and dolomite zones
 - ORDOVICIAN**
 - SUNBLOOD FORMATION: argillaceous, bioclastic limestone
 - CAMBRIAN**



57-1-5-31

