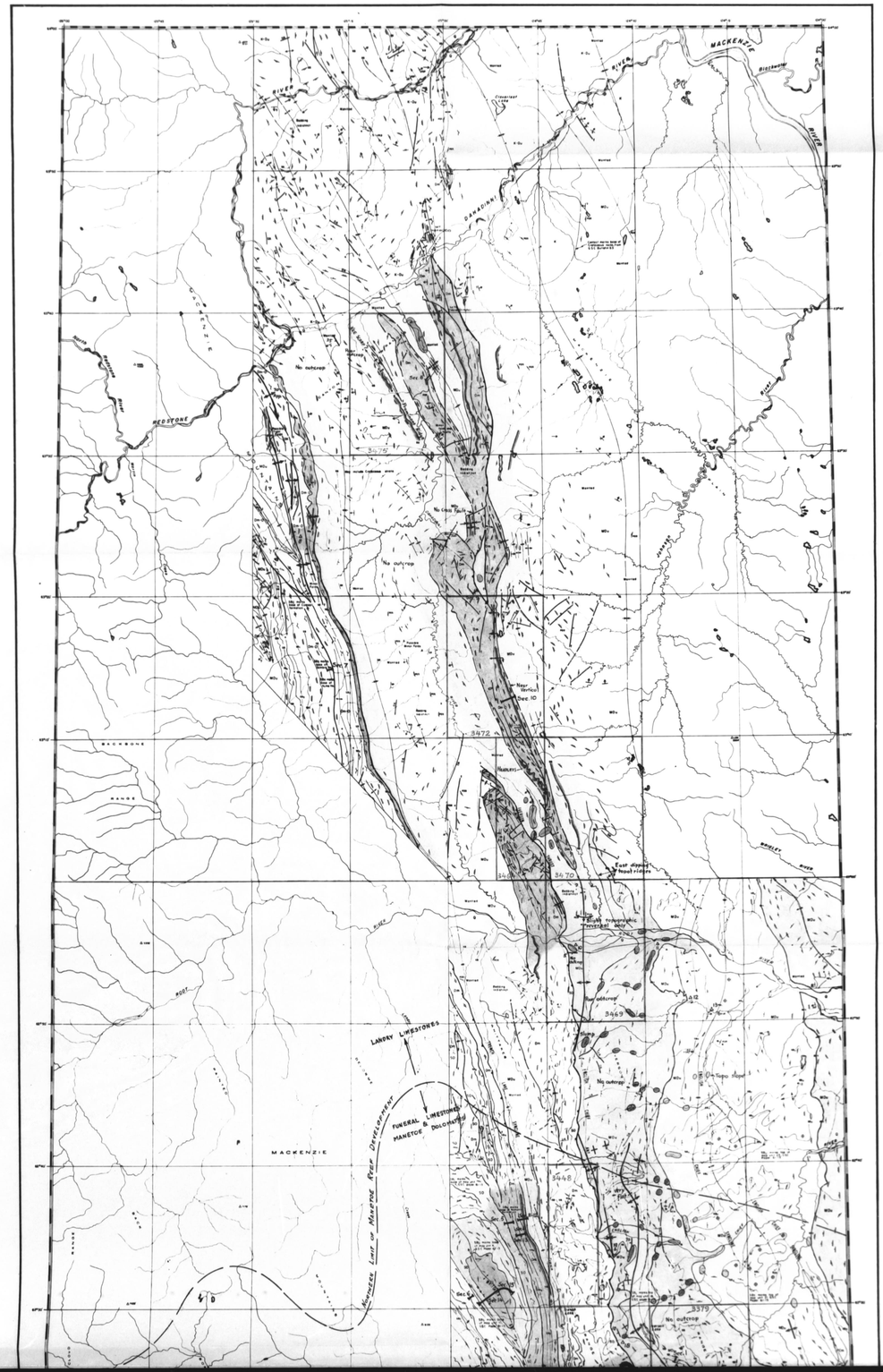
DAHADINNI RIVER
95 N



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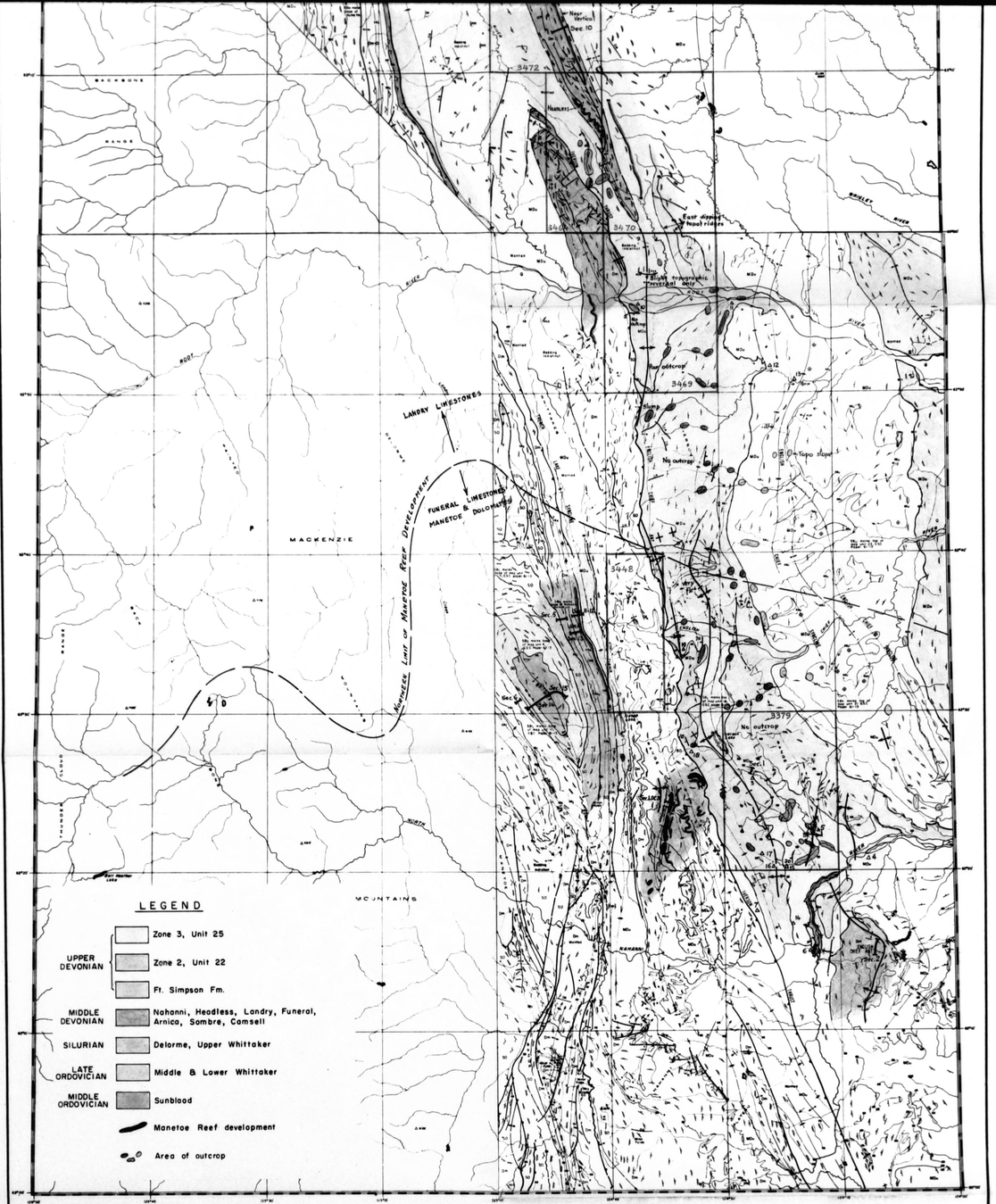


LEGEND
FORMATION OR GROUP AND DOMINANT LITHOLOGY

GEOLOGICAL SYMBOLS

GEOMORPHIC SYMBOLS

CULTURAL AND GEOGRAPHICAL SYMBOLS

AREAL GEOLOGY AND STRUCTURAL INTERPRETATION MAP OF THE NORTHERN RICHARDSON MTNS. NORTHERN PEEL PLATEAU AREA YUKON AND NORTHWEST TERRITORIES

- Prepared by -
W. ZAY SMITH ASSOCIATES LTD.
CALGARY, ALBERTA

SCALE
One inch to four miles

INDEX TO MAP SHEETS

2 OF 2

REPORT ON

THE GEOLOGICAL SURVEY

ROOT RIVER AREA

Northwest Territories

BY

TECK CORPORATION LIMITED

Canadian Devonian Petroleum Division

JUNE 1963 - OCTOBER 1964

TABLE OF CONTENTS

TABLE OF ILLUSTRATIONS

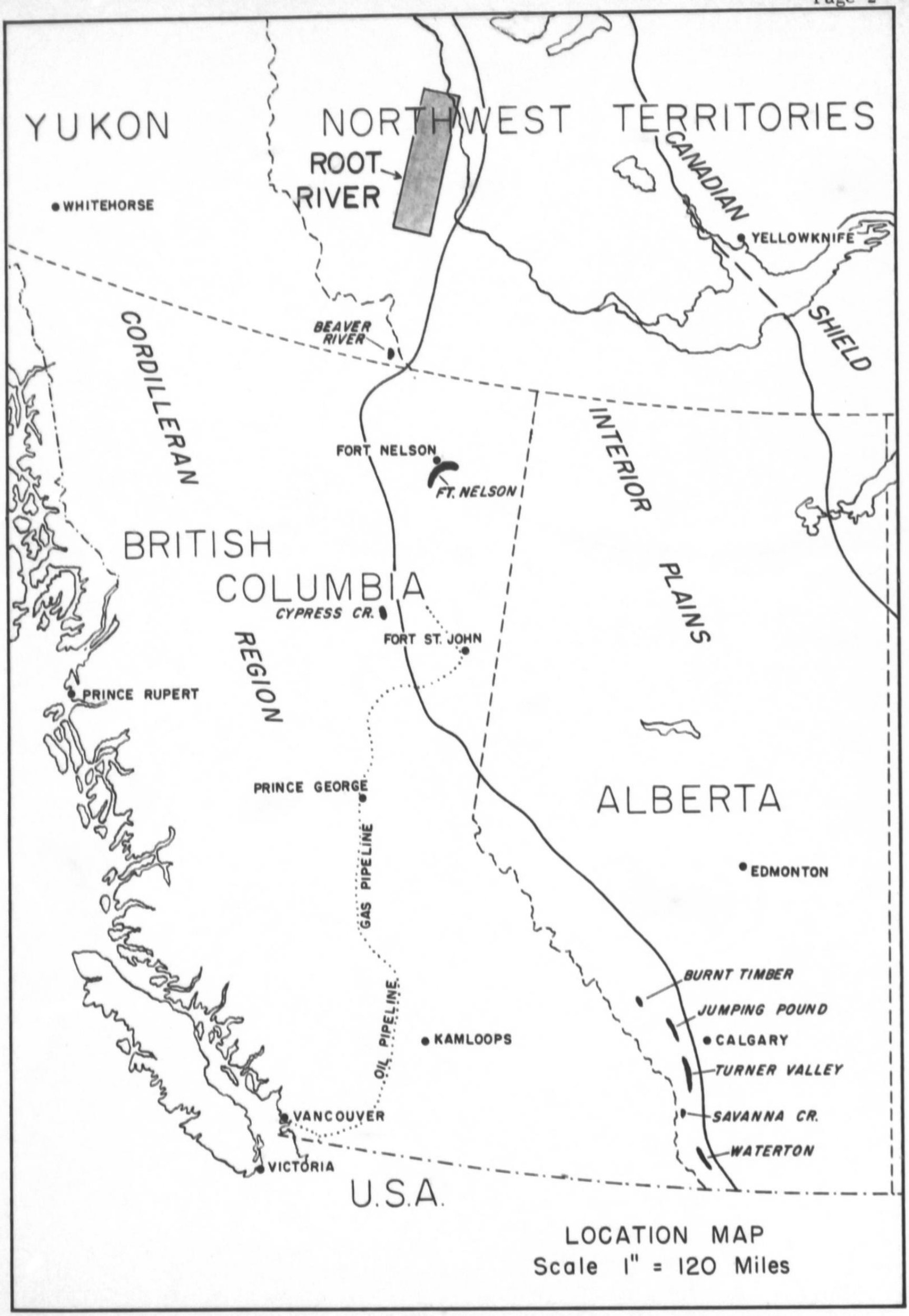
INTRODUCTION

Teck Corporation Limited and Oil and Gas Futures jointly hold five permits and Teck Corporation has a 100% interest in two permits in the general"Root - English Chief river area"of Northwest Territories. These permits are as follows:

SUMMARY OF PERMITS

Permit No.	Area	Date Acquired	Acquisition Cost	Next Obligation Date
3379	59,310	Dec. 13, 1962	$ 6,524.10	Dec. 13, 1965
3448	29,490	Dec. 14, 1962	-	Dec. 14, 1965
3464	28,995	May 10, 1963	-	Nov. 10, 1964
3469	58,320	May 23, 1963	15,163.20	Nov. 23, 1964
3470	57,990	May 23, 1963	78.00	Nov. 23, 1964
3472	57,660	May 23, 1963	14,990.00	Nov. 23, 1964
3475	56,996	May 23, 1963	78.00	Nov. 23, 1964

Acquisition of the first two permits in December of 1962 was based on field work done previously by geologists of Teck Corporation. The later acquisitions were based on a photo geological study by V. Zay Smith supplemented with Teck's own knowledge of the geology. During the summer of 1963, Teck conducted additional work in the field which comprised detailed stratigraphic studies and reconnaissance type structural studies. The stratigraphic sections and the V. Zay Smith airphoto interpretation are attached to this report. Notations have been made on the enclosed map to indicate where field work data are at variance with airphoto data.



LOCATION MAP
Scale 1" = 120 Miles

SUMMARY AND CONCLUSIONS

PERMITS 3379 and 3448

The two major prospective horizons for accumulation of oil and gas in these two permits are the Manetoe Reef of Middle Devonian age and the reefs that occur in the Silurian and Ordovician sections. The Manetoe Reef can have up to 700 feet of porous thickness and reefs of Ordovician and Silurian age can be up to 2,300 feet thick. These reefs could be productive either in association with anticlinal folding, or in structurally flat areas where they may form stratigraphic traps. The optimum case is where maximum development is associated with anticlinal folding. Other horizons have prospects but they are minor by comparison with these reef masses.

From a market standpoint the general area appears to be remote. However, the potential of the area is such that major fields will be found in this, or nearby local areas. When one or two major fields are discovered, access to markets will follow.

The topography of the stream and river channels west of the Mackenzie River is such that access to the area can be obtained at reasonable cost. A winter road would be required which could be built along the braided streams of the Root or English Chief rivers.

In summation, Permit 3379 and the surrounding area is one which could hold major reservoirs of oil and/or gas. Access to the area, while not easy, compared to areas of south and central Alberta, is not too difficult. Depths to the major objectives are approximately Manetoe reef - 1,500 feet, Silurian - Ordovician reef - 7,000 feet on the crest of the English Chief anticline at the central west side of Permit 3379.

PERMITS 3464, 3469, 3470, 3472, 3475

With the exception of 3469 these permits are considered to be much less prospective than the above due to the acute structural conditions and also due to the absence of the Manetoe Reef. However, they may be in a good environmental position for maximum development of the reefs in the Silurian and Ordovician sediments.

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P. Eng. Alta, B.C.

C. D. McCord
P. Eng. Alta, B.C.

OBJECTIVES OF SURVEY - FIELD AND REPORT PROCEDURE

The field survey was conducted on and in the vicinity of the Permits held by Teck Corporation Limited in the English Chief Area, Northwest Territories in June 1963. The Geological Survey of Canada had published a paper, G.S.C. 61-13, on "Camsell Bend and Root River Map Areas, District of Mackenzie, Northwest Territories," in the spring of 1962. Therefore, the main objective of the field survey was to supplement this information by measuring and describing in detail rock outcrops adjacent to the Permit areas. This data was compiled into stratigraphic logs that cumulatively could be used to predict a stratigraphic section most probably to be encountered by a test hole drilled on the English Chief Anticline.

The Geological Survey of Canada's work divided the exposed stratigraphic section into formations and provided excellent summary descriptions of each. An attempt was made by Teck field personnel to measure and describe the formations some distance removed from the location of G.S.C. sections, but although different locations were chosen, the best exposures were in near proximity to the sections measured by the G.S.C. Thickness figures resulting from calculations of chained profiles by Teck Corporation are very closely comparable with those published by the G.S.C. Some discrepancies in the detail of description of strata and choice of formation boundaries did result. The data in this report has not been altered to agree with the G.S.C. interpretation, but represent original field interpretations.

The information gathered from this detailed field measurement gains true value when assimilated in "Stratigraphic Logs" as presented in this report. To assist the reader to relate the various stratigraphic logs a diagrammetric summary of formation thicknesses measured and section relationships is presented on Page 5 . These logs have been used in an attempt to correlate information available to our firm from G.S.C. reports, previous field surveys and stratigraphic test holes in the area. Comments on this correlation are forwarded under a general discussion in the stratigraphic section of this report. A diagrammetric summary presentation is included on Page 7.

DIAGRAMMATIC SUMMARY

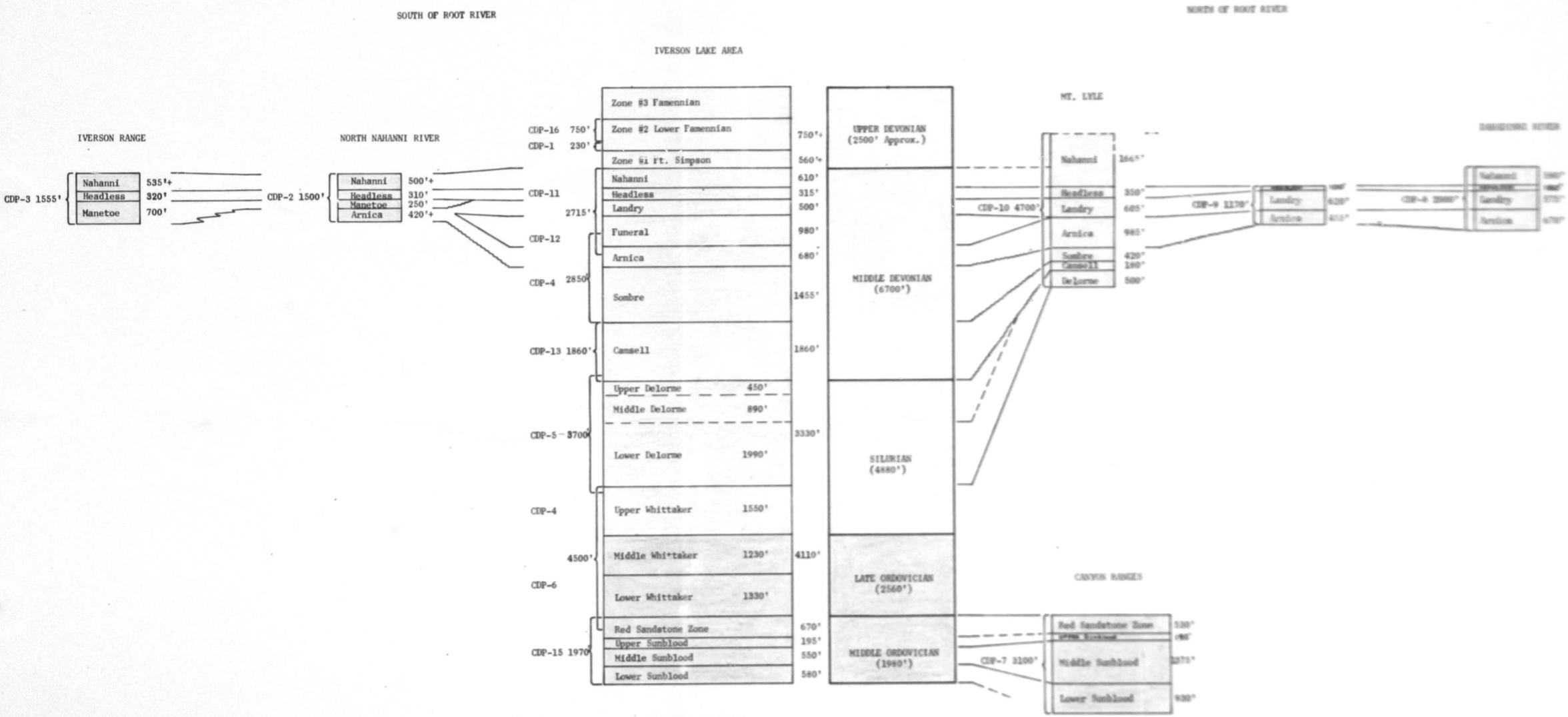
SHOWING

THICKNESSES MEASURED

and

RELATIONSHIP OF SECTIONS

ROOT RIVER AREA



STRATIGRAPHY

GENERAL DISCUSSION

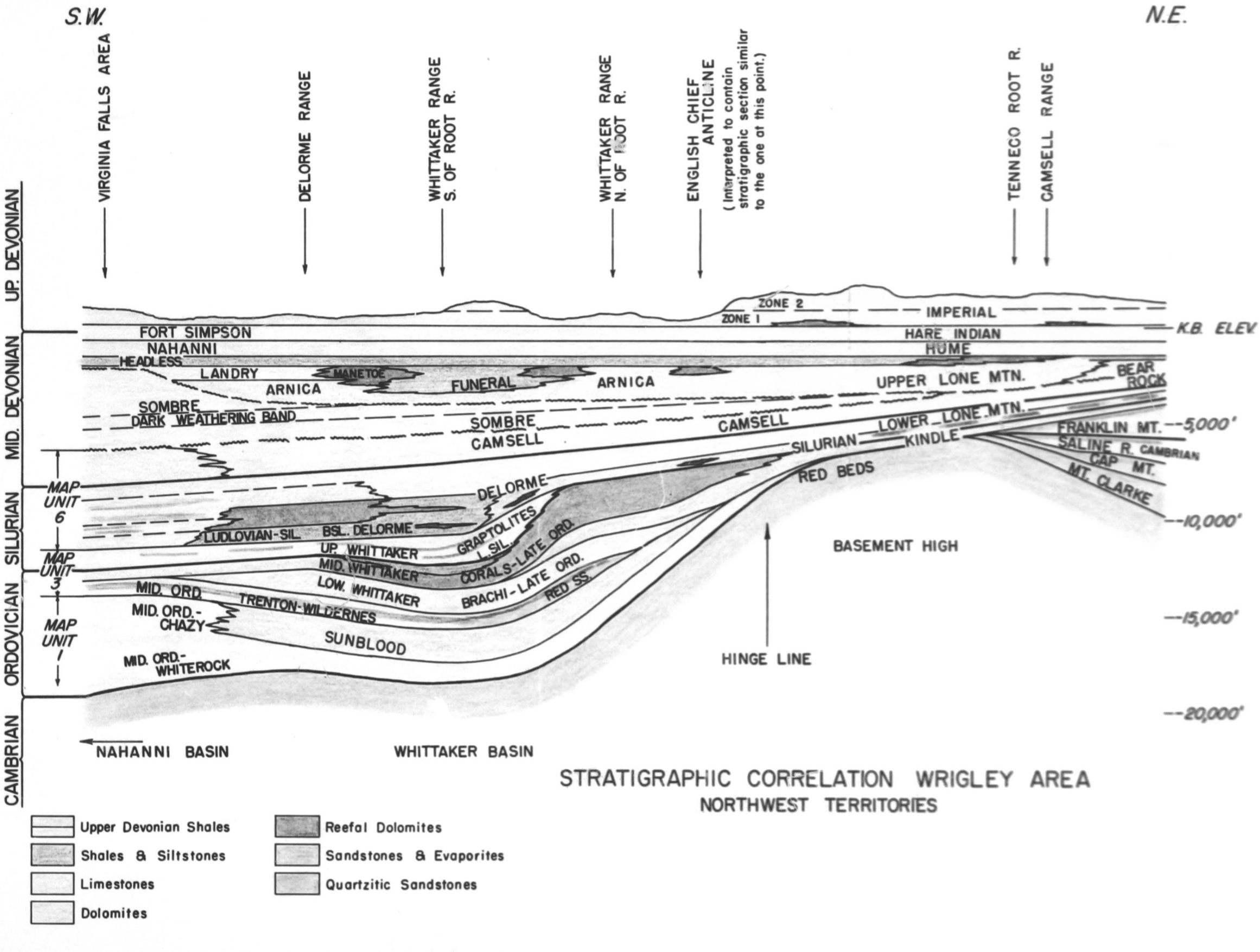
A Stratigraphic Correlation of sections known in the Wrigley area has been presented on Page 7. This comparison of sediments, their thicknesses, lithology and diagnostic fossil content reveals a vast change in sedimentary environment in a relatively short distance and the area of change is located beneath the English Chief Anticline.

Immediately to the west of the Permits held on the anticline, the sedimentary section revealed in the overthrust rocks of the Canyon Ranges has a thickness in excess of 20,000 feet in the time range from the Middle Ordovician period to the Upper Devonian period. This section is predominantly comprised of marine carbonates and shales. There are continental and evaporitic deposits.

The section contains several horizons that exhibit lateral facies changes. The outstanding section is that between the Headless and Arnica formations of Middle Devonian Age. This interval can contain one, or more, of three phases of deposition; the Landry Formation of cyclically bedded tight limestones; the Manetoe Formation of coarse crystalline, "reefal," porous, dolomite; or the Funeral Formation of black, limy shale and tight argillaceous limestone.

Two other important zones that change laterally and contain "reefal" dolomite zones are the Delorme Formation of Silurian Age and the Whittaker Formation that ranges from Late Ordovician time to early Silurian.

Within a distance of thirty miles eastward the thick stratigraphic sequence thins to less than 10,000 feet, or to one-half. This situation suggests that the pre-Devonian depositional environment changed from an actively submerging basin to an area of relatively stable shelf conditions. The English Chief Permit area could be positioned at the hinge line separating these two environments and consequently be in an area of on-lap and stratigraphic pinchout of basin sediments.



STRATIGRAPHIC CORRELATION WRIGLEY AREA
NORTHWEST TERRITORIES

STRATIGRAPHY

UPPER DEVONIAN

Zone 3

(Thickness Unknown)

Unit 25, GSC Paper 61-13

This zone of the Upper Devonian is generally tree covered as illustrated in Kodachrome #1. Approximately twenty spots were seen to have outcrop of the formation from the air. Three of these outcrop were visited by helicopter. The zone is comprised of a thick shale of a yellow-tan or green shade that may weather locally with a purplish grey colour. The zone has minor thin resistive beds in the base and is capped by a resistive siltstone bed. The fossils collected from this section represent the Upper Devonian Famennian stage. (See summary of outcrop descriptions for fossil identifications.)

Zone 2

(750' +)

Equivalent to Map Unit 22, GSC Paper 61-13

Approximately thirty-five outcrop points were noted in this formation from the air and six of these points were accessible by helicopter and were visited. Kodachromes 6, 7 and 8 illustrate three of the outcrop areas that were examined. Fossils collected from the zone indicate that the strata is of the lower Famennian stage of the Upper Devonian. It is comprised of shale, tan-grey or brown earthy weathering with numerous resistive slabby siltstone, sandstone and limestone horizons within it. The zone is capped with a massive siltstone bed that marks the boundary with the yellow homogeneous shale of Zone 3 above it.

Zone 1

Fort Simpson Formation
(560+)

Equivalent to Map Unit 18, GSC Paper 61-13; has been named the Fort Simpson Formation by the Geological Survey of Canada.

This basal unit of the Upper Devonian has been referred to formerly by the author in this area as the Hare Indian Shales. It outcrops quite frequently in the area and was visited at five stations. The unit consists of shale, coal black, carbonaceous, fissile non-calcareous in the upper parts and limy with ironstone concretions and limestone bands near the Nahanni limestone contact. Shale weathers grey to black with rust and yellow streaks in patches from iron oxides. Kodachromes 9, 10 and 11 illustrate outcrop of this formation.

MIDDLE DEVONIAN

Nahanni Formation
(600')

The formation as illustrated in the foreground in Kodachrome 12 is comprised of 600' of thin-bedded limestones that are blue-grey, black, fine to cryptocrystalline, tight. The formation is moderately resistive, but it does contain traces of shale laminae and consequently weathers in a rubbly nature in part. Calcite and horn corals are commonly present. The limestone often has a fetid odour. Nahanni strata can also be viewed in Kodachromes 3, 4, 5, 9, 14, 19, 20, 21 and 22 as resistive outcrop either adjacent to tree covered Fort Simpson Shale, or capping the recessive Headless Formation.

Headless Formation
(300')

This formation is a thin zone about 300' in thickness that contains recessive shale beds interbedded with fossiliferous limestones similar to those of the Nahanni Formation. The formation serves as a distinct separation between the Nahanni and the Upper Devonian formations that occur below. See recessive swail in Kodachrome 13, 14, 61, 19 20, 21 and 22.

The limestone in this formation can be blue-grey, brown or black; is crypto-crystalline, argillaceous, thin-bedded to platy and weathers buff. Shales can be green-grey, soft or brown-grey, platy, limy and soft with smooth bedding planes. Generally the shale zones in this formation are covered intervals.

The formation situated stratigraphically below the Headless formation may be one of three: the Landry formation; the Manetoe formation; or the Funeral formation. These formations represent three different facies that were deposited contemporaneously.

Landry Formation
(0 - 600')

The Landry formation is comprised of 600' of cyclically bedded limestone that varies in character from crypto-crystalline, siliceous; to argillaceous, shaly, brownish-blue grey grading to limy mudstone. No porosity was noted in either of these variations. The formation weathers with a characteristic serrated nature caused by the variable resistance of these cyclically deposited beds to erosion. The formation contains both thin platy and massive bedding and is generally a light grey weathered colour from a distance. The limestones of this formation as noted above, can occupy the entire interval between the Headless and Arnica Formations as at Sections CDP 8, 9 and 10, or they can be replaced by the shales of the Funeral formation. The lower beds of the Landry were seen to phase out into shale on Section 11 & 12. Kodachrome 15 shows the Landry - Funeral Contact on Section 12, but the phasing out of limestone to shale is not evident.

Manetoe Formation
(0-700')

Where present the Manetoe reef development occurs within the interval between the Arnica and Headless Formation and is considered to be one facies in a three phase depositional period involving Manetoe, Landry and Funeral Formations. It was

observed immediately below the Headless formation in Sections CDP-2 and CDP-3, but also occurs as isolated mounds within the Funeral Formation (Kodachrome 22). The formation is comprised of massive coarse crystalline dolomites that can be any thickness up to possibly 700 feet. The dolomites are dark grey to black, granular, or white coarse crystalline with vuggy porosity. The dolomites are thick-bedded and generally weather white with a rounded nature. Bedding is generally not discernible within the formation and it appears to be one massive zone. There are generally abundant veins and patches of white coarse crystalline dolomite with traces of quartz. The reef usually outcrops as resistive knobs surrounded by less resistive Funeral shales and are quite obvious from the air in some localities, (See Kodachromes 17 - 22 inclusive).

Funeral Formation
(0 - 980')

The Funeral Formation, as described in Section CDP-12, is a shale facies of the Landry and Manetoe formation. The formation was measured to be 980 feet thick with two-thirds of the zone being shale. The shale is black, powdery, limy, hard, weathers with a yellow-brown, slabby nature. Limestones within the formation are purplish dark grey, fine crystalline, thin bedded, fossiliferous. The formation is generally recessive and calcite veins are generally noted within the beds. The recessive nature of the formation is illustrated in Kodachrome 14 where the Funeral shales form the smooth slope immediately west of the resistive rugged limestones of the Landry Formation.

Arnica Formation
(800' +)

The Arnica formation (CDP-4 and CDP-10) is comprised of 800' $\pm$ of dolomites, massive bedded and thin-bedded. The dolomites are black, very fine granular, can be limy and siliceous with black chert inclusions, and contain considerable amounts of calcite fossil detritous which appear to be crinoid stems in some outcrop. Zones within the

formation contain breccia porosity in part. There is an indication that the calcite vein sections have been brecciated due to the presence of less competent, argillaceous, laminated, coarse grained or granular dolomite. Inter-granular and vuggy porosity was noted. In Kodachrome 23 the formation can be recognized by the dark grey weathering color. The Sombre Formation (on which a helicopter is resting), weathers light grey as do the Funeral shales stratigraphically above the Arnica Formation.

Sombre Formation (1,755')

The Sombre formation of the mapped area reaches a thickness of 1,755 feet in CDP-4. It is comprised of massively bedded dolomites, medium blue-grey with zones containing shale fractures and fossil horizons. The formation has a banded weathered character, wherein light and dark grey weathering bands reflect a variable argillaceous content of cyclically deposited strata. Shale laminae on bedding planes in the cyclic zones are brown and light green to tan weathering with rust and red staining from iron content on the more irregular bedding planes. In the basal one-third of the formation porous zones were noted in softer granular porous dolomite. Porosity is inter-granular in the two localities where it was noted. See Kodachrome 27 for close-up view of porous Sombre dolomites in Section 10, north of Root River.

Camsell Formation (180' - 1,860')

The Camsell formation thickness varies from 180' to 1,860' in the map area, the thickness being controlled possibly by depositional circumstances and also by a pre-Sombre erosion surface. The formation as illustrated in CDP-13 consists of brecciated limestones, or possibly as in Section 10 north of the Root River, these could be limy dolomites. The limestone breccia is angular and of a widely variable size with a coarse crystalline, calcite matrix, (see Kodachrome 24), orange yellow weathering. The fragments are argillaceous limestone, very finely crystalline tan grey weathering. The porous brecciated upper part of the formation weathers semi-resistive, rounded, rubbly. In the central section of the formation there are shale beds.

The shale is soft, yellow weathering with calcite veins common, but brecciation is not as well developed as at the top of the formation. The lower part of the formation is again a brecciated, massive bedded, grey buff, argillaceous, granular, crypto-crystalline limestone. Shale beds occur in part, particularly at the base of the section where they are irregularly platy, limy and orange weathering.

SILURIAN

Delorme Formation (3,330')

The Delorme formation was examined at two locations; one south of the Root River, Kodachrome 25 and one north, Section CDP-10. Section 5, south of the Root River, gives the most complete description of this thick Delorme formation. The brown-grey recessive character of the formation is illustrated in the Kodachrome view. It has been divided into three sections: the Upper Delorme; Middle Delorme; and Lower Delorme formation. All of the formation is of Silurian Age.

Upper Delorme Formation (450')

Comprised of 450' of limestone, light grey to white, finely crystalline, laminated with variable argillaceous content. Contains uneven, shaly bedding planes; is thin bedded and weathers into a yellowish cream, flaggy debris. One-half the section is covered and is considered to represent shale. The limestone was observed to grade to a limy shale in places.

Middle Delorme Formation (890')

Comprised of 890' of fossiliferous dolomite, which ranges from light grey to blue grey to dark grey, is finely crystalline, commonly argillaceous with shale laminae between unevenly, flaggy, limy beds.

The upper strata contains dolomites that are siliceous and limy with concentrated fossil zones that could be considered to be dolomitic limestones.

The dolomite in the lower half of this section is not limy, is not fossiliferous and is characterized by thin argillaceous laminae and calcite veins. Local siliceous zones with black chert also occur in this basal zone.

Lower Delorme Formation (1,990')

This zone is comprised of thick shale intervals and thin bedded and massive bedded dolomites. The dolomites are medium grey, in part limy, laminated to banded light and dark grey, and are variably argillaceous. The occasional massive bed makes the formation semi-resistive. This lower part of the formation is generally unfossiliferous and no porosity was noted in the dolomites. The massive shale beds that occur in the lower two-thirds of this Lower Delorme Formation contain shale that is black, slaty and weathers yellowish grey (Kodachrome 29). Where the shale is cyclically interbedded with the dolomites, it is limy. The Delorme Formation described in Section 10, north of the Root River, was comprised of massively bedded banded dolomite that had variable argillaceous content with a trace of granular porous beds with intergranular porosity. The dolomite was fetid and laminated on weathered surfaces in part. This section would correlate best with the dolomites found in the Lower Delorme Formation described in Section 5, northwest of Trench Lake. Here the dolomites are banded and variably resistant according to their argillaceous content and some fragmental and coarse crystalline beds were noted. This correlation would require non-deposition, or erosion of the Upper and Middle Delorme Formation, north of the Root River.

Whittaker Formation (4,130')

The thick strata included in the Whittaker Formation is diagrammatically illustrated in Section CDP-6 and CDP-14 where they have been divided into three zones. The three zones straddle the ages from Late Ordovician to Lower Silurian.

Upper Whittaker Formation (Lower Silurian) (1,550')

The Upper Whittaker is comprised of 1,550' of shale, medium dark grey that weathers a light tan to dark grey, Kodachrome 28. The shale is limy; platy in the lower portion, blocky at the top. There is a trace of calcite filled fractures, also thin beds of calcite shell fragments. Some variability in the composition of the shale is reflected by alternating zones of black, slightly siliceous shale and soft brown earth forming shale. The entire zone is recessive. An occasional outcrop of resistive, thin-bedded, black, finely crystalline limestone was noted.

ORDOVICIAN

Middle Whittaker Formation (Late Ordovician) (1,230')

The Middle Whittaker Formation is comprised of shale, black, slabby to platy, similar to Upper Whittaker, but it is now dolomitic rather than limy. The occasional thin bed of argillaceous dolomite and zone of nodular chert occur in this shale zone. The lower half of the Middle Whittaker is comprised of massively bedded dolomites that are medium greenish-grey to black in colour, very finely crystalline to crypto-crystalline, buff to dark grey weathering with abundant interstrata coarse crystalline dolomite and quartz. In the lower portions there are abundant silicified colonial and horn corals with chert nodules and thick veins of chert and white quartz.

Lower Whittaker Formation (Late Ordovician) (1,330')

The Lower Whittaker Formation is comprised of limestones; massively bedded in the central portions and thin-bedded in the upper and lower boundaries of the Section. The limestone is black, medium crystalline to crypto-crystalline, quite argillaceous, fossiliferous, with a variety of species.

The limestone in the central massive bedded section is dark grey to black crypto-crystalline and siliceous, also very fossiliferous and contains wavy purple colored fracture planes characteristic of the Section. Covered intervals in this middle massive section probably represent shale zones. Shale was described in the lower one-third of the Unit. It was black, granular, carbonaceous, soft, limy, weathered a light grey and had a trace of calcite veining. The shale also occurs in the thin bedded limestones at the base of the unit where it causes semi-spherical fracturing laminae that are characteristic of the Section. Calcitic fossil fragments continue to be common and the occasional limestone bed is a fossil fragmental. Black chert nodules were noted in the basal portion of the Unit, but were restricted to a 80 foot zone.

Red Sandstone Zone
(Middle Ordovician)
(530' - 670')

The Sun Blood Formation illustrated in Sections CDP-7 and CDP-15 is considered to be of Middle Ordovician Age. The Formation has been divided into four sections. The Upper Section consists of thin-bedded limestones and dolomites; the limestone is dark grey to black, crypto-crystalline to medium crystalline, fossiliferous in part, fragmental in part, platy, argillaceous, with shale laminae, orange weathering. Limy, slaty shale beds weather purple or rust colors from oxidation of sulphide minerals present. The shale could comprise 50% of the Section when covered intervals are interpreted to be shale. Dolomite occurs below the shale limestone interbeds, it is green grey, very finely crystalline, platy, blocky to massive in part, interbedded with platy dolomite that is limy, argillaceous, orange weathering, similar to the limestones above. This section is possibly correlatable to the red sandstone zone reported on the Nahanni range to the south (GSC Paper 60-19), and to the sandstone zone north of Root River as described in Section CDP-7 of this report. The zone

is considered in other localities to be the Trenton Wilderness stage of the Ordovician.

Sunblood Formation

Upper Sunblood (195')

The second unit of the Sunblood Formation as described in CDP-15 on the Whittaker anticline is possibly representative of the Upper Sunblood sedimentary sequence with the "Red Sandstone" and correlative limestones described above, constituting a separate younger formation.
This thinner Upper Sunblood unit is comprised of 180' - 195' of thin bedded to slabby siliceous to gritty dolomites. Coarse crystalline quartz is abundant in the very resistive beds.

Middle Sunblood (530' - 1,375')

The Middle Sunblood Formation is comprised of massively bedded dolomites that are a tan to black colour, coarse crystalline, tight with some zones of sucrose porous beds containing traces of chert nodules. The section weathers a yellow-brown colour and is characterized by an abundance of purple and milky chert beds and nodules and coarse crystalline quartz. Another characteristic common to the two sections CDP-15 and CDP-7 are the deep cuts created by differential solution of laminae or inclusions of dark grey argillaceous dolomite.

Lower Sunblood (580' - 930'?)

The lower unit of the Sunblood Formation is possibly of the White Rock stage of the Middle Ordovician. It is of a thickness in excess of 600 feet and is comprised of limestone, milky grey, crypto-crystalline to fragmental, massive bedded, inter-bedded with argillaceous, dolomitic, slaty shale. The lower part of the Section contains calcite filled fractures with iron and copper sulphide mineralization. The section weathers with a light grey colour. To the north of Root River the section that is possibly correlative is recessive and contained few good outcrop. One outcrop that could be examined was of limestone, soft, yellow, weathering.

STRATIGRAPHIC TABLE

ROOT RIVER AREA

AGE	FORMATION	THICKNESS	GENERAL STRATIGRAPHY	
UPPER DEVONIAN	Upper Famennian		Shale	Yellow-tan or green, weathers purplish grey in part. Minor thin resistive siltstone beds.
	IMPERIAL FORMATION			
	Lower Famennian	750'+	Shale	Tan-grey to brown earthy. Numerous thin siltstone, sandstone and limestone beds
	FORT SIMPSON FORMATION (Hare Indian)	560'+	Shale	Black, carbonaceous, limy, with ironstone and limestone near Nahanni contact.
MIDDLE DEVONIAN	NAHANNI FORMATION	600'	Limestone	Blue-grey to black, fine crystalline, tight fossiliferous, fetid, contains shale laminae
	HEADLESS FORMATION	300'	Shale	Green-grey, soft recessive, platy, limy with interbeds of limestone as in Nahanni.
	LANDRY FORMATION	0 - 600'	Limestone	Brownish-grey, cyclically bedded, variably argillaceous or arenaceous, tight.
	MANETOE FORMATION	0 - 700'	Dolomite	Dark grey to black, coarse crystalline, excellent intercrystalline and vuggy porosity.
	FUNERAL FORMATION	0 - 980'	Shale	Black, limy, hard, slabby, interbedded with limestone, thin-bedded, fossiliferous, tight.
	ARNICA FORMATION (Lone Mountain Fm)	800'+	Dolomites	Black, fine crystalline, siliceous with chert inclusions, tight with trace of breccia porosity.
	SOMBRE FORMATION (Lone Mountain Fm)	1755'	Dolomites	Blue-grey, massive bedded with shale laminae. Some intergranular porosity in basal beds.
	CAMSELL FORMATION	180'-1860'	Limestone Breccia	Angular, variable size fragments of argillaceous limestone in coarse crystalline, orange weathering calcite; vuggy porosity.
SILURIAN	DELORME FORMATION Upper	450'	Limestone-Shale (50 - 50)	Light grey, laminated, tight.
	(Reefal & porous in Delorme Rge. of Mtns.) Middle	890'	Dolomite	Light to dark grey with fossil and chert laminae, tight.
	Lower	1990'	Shale	Black, slaty and Dolomite, massive bedded, banded, tight.
	WHITTAKER FORMATION Upper	1550'	Shale	Medium dark grey, limy, platy, variably siliceous.
ORDOVICIAN	(Mt. Kindle) Middle Formation)	1230'	Shale & Dolomite	Black, slabby, dolomitic. Dolomite contains abundant chert, coral and coarse crystalline zones.
	Lower	1330'	Limestones	Black, argillaceous, fossiliferous, purple shale laminae.
	"RED SANDSTONE ZONE"	530'- 670'	Limestone	Shale and minor dolomite, thin bedded dark grey to black, orange and purple weathering from iron sulphides.
	SUNBLOOD FORMATION (Franklin Mtn. Fm) Upper	195'	Dolomite	Thin bedded, slabby, siliceous to gritty, with quartz.
	Middle	530'-1375'	Dolomite	Tan to black, massive bedded, trace sucrose porosity.
	Lower	580'- 930'+	Limestones	Milky-grey, massive bedded, interbedded with dolomitic slaty shale, copper sulphides and calcite in fractures.

ROOT RIVER AREA - NORTHWEST TERRITORIES

OUTCROP NOTES

These notes are records of observations made at helicopter stops where sections were not of sufficient length in all cases to warrant representation in a diagrammatic manner.

STATION 3 — Shale outcrop two miles southeast of Iverson Lake on banks of east flowing river; 65° AZ/5° NW. This outcrop is represented in a stratigraphic column CDP-1. It is comprised of a basal 155 feet of shale, soft, laminated, green and brown-grey, with very occasional thin siltstone laminae less than 1" thick, non-calcareous except at base near the Hare Indian contact where limy black concretions are present. Above this shale there are 70 feet of shale and siltstone interbedded; shale was olive green, sericitic, non-calcareous, brown weathering. Siltstone was olive green-grey, limy, cliff forming, occurring in massive beds, also thin bedded with shale laminae. This section is considered to comprise the basal part of Zone 2 in Upper Devonian sediments.

STATION 4 — Shale outcrop on the south bank of the North Nahanni River 12 miles southeast of Iverson Lake. Outcrop was of homogeneous, black, hard, sharp-edged shale, referred to as "the Hare Indian Formation" or"Zone 1 of the Upper Devonian" and considered to be equivalent to the Fort Simpson Formation (G.S.C. Paper 61-13).

STATION 5 — Limestone outcrop 8 miles southeast of Iverson Lake - limestone outcrops in the canyon of the southeast flowing stream; the limestone is black, fine to microcrystalline, tight, contains many calcite veinlets in patches; the outcrop is capped by the Hare Indian Shales, both upstream and downstream. The attitude of the limestone is 195° AZ/18° NW at this station, but is believed to be dormal in shape. The limestone would be the upper beds of the Nahanni Formation.

STATION 6 — Canyon in the North Nahanni River, 16 miles southeast of Iverson Lake.

The outcrop at this point consists of cliffs of the Hare Indian Formation, and the Nahanni Limestone outcrops at river level. The cliffs contain shale, limy fissile, coal black, with numerous large concretions; also 3 - 4 foot bands of black lithographic limestone. The shale weathers with rust and yellow colors similar to a coal deposit. Attitude at the Nahanni-Hare Indian contact was 135° AZ/9° SW (see Kodachrome's 13 and 14). The Nahanni outcrop at this point consists of limestone that becomes more argillaceous upwards and grades into the Hare Indian Shale. The lower limestone bed is irregularly platy, with pitted bedding surfaces; it is dark grey in color, not black; limestone stratigraphically higher becomes more argillaceous and more slabby bedded, somewhat granular textured, black in color, pyritic. The next beds upward in section are blue-grey to black, brownish on fractured surfaces, lithographic, tight, with pyrite laths. Higher beds are limestone, black, microgranular, pyritic, with bulbous calcite replaced brachipoda, brownish tinge on fractured surfaces. This bed lies immediately below the Hare Indian Shale. Fossils collected here were identified as Leiorhychus Castanea of Middle Givetian stage and Michelinoceras sp. (Middle Devonian).

STATION 7 — Located immediately west of the North Nahanni Canyon and located 12 miles southeast of Iverson Lake. Outcrop at this point contains very light olive green, soft shale that weathers maroon in part; it has a trace of a conchoidal fracture; this outcrop is considered to be in Zone 3 of the Upper Devonian (equivalent to Unit 25, G.S.C. Paper 61-13).

STATION 8 — Located 17 miles southwest of Long Lake in the Canyon Ranges. The outcrop consisted of limestone, brownish dark blue-grey, finely crystalline, fossiliferous, thin and thick bedded, 8" to 2' thick, weathers light grey. The bedding was semi-rubbly in part, resistive, ridge forming.

STATION 9 — Another stop on the Canyon Ranges; the lithology at this point is described in Section CDP-7.

STATION 10 — A shale outcrop located on the south bank of the Root River immediately in front of the Iverson thrust. The shale here had an attitude of 90° AZ/5° S; the outcrop consisted of a 220 foot cliff; the shale was brownish weathering, soft, limy, with some large concretions near the base of the outcrop. The shales here do not look as hard and sharp as other outcrops of the Hare Indian, but they are quite black on fresh surfaces and appear quite brown and soft particularly in the lower beds at river level. There was no "sulphur-type" yellow and orange staining on the outcrop at this elevation. Higher in the cliff the rust and yellow sulphur stains do occur on the shale, which is quite black and fractures in a concretionary manner. The shale on the upper part of the outcrop is not limy, it is quite soft, still black on a fresh surface, not silty; in fact there are no resistive beds whatsoever; weathers light grey to dark grey.

STATION 11 — Also located in the south bank of the Root River, eight miles to the east of the Iverson thrust. The outcrop consists of thick resistive siltstone beds, green colored, limy, and form the top of a 100 foot cliff; below the silt bed there are shales and massive limestones inter-bedded; the shale is soft, green, grey and has limy laminae. The limy laminae and limestone beds contain fossils, the most conspicuous being a bulbous brachiapoda that occurs in concentrated layers through-out the whole outcrop. These fossils were identified to be Lower Famennian in age, and included Crytospirifer Whitneyi, Leiorhynchus Walcotti and Cyrtiopsis Nahanniensis. The sediments at this section are all interpreted to belong to Zone 2 of Upper Devonian Age.

STATION 12 — Located 5 miles south of the Root River, slightly to the southeast of Station 11. Outcrop here consists of a 150 foot cliff comprised of shale, tan cream color, soft, with limy laminations and some calcite veins; outcrop weathers tan. Fossils collected along the laminae were identified as worm tubes. The outcrop is considered to be the lower part of Zone 3 of Upper Devonian Age.

STATION 13 — Shale outcrop located 2 miles to the southeast of Station 12 consists of green, soft shales inter-laminated with calcareous siltstones, near the top of Zone 3 of Upper Devonian Age. The shale laminae on the siltstone bedding planes weathers purplish and contains fossils. The specimens collected represent Famennian Age of the Upper Devonian and included Cyrtospirifer sp. and

Leiorhynchus sp. The attitude of the beds of this outcrop was 180° AZ/25° E. The outcrop in places appeared to have a red hematitic color on the weathered surface.

STATION 14 — Located one mile west of the North Nahanni Canyon, an outcrop of banded shale, earthy brown color to tan, flaggy, silty. The lower beds are dark grey to black; it is believed that this outcrop represents the contact between the basal zone of the Upper Devonian (Fort Simpson - Hare Indian) and the Middle, (Zone 2), shales of the Upper Devonian.

STATION 15 — Nine miles southeast of Iverson Lake, in an oxbow outcrop in a stream cutting through Hare Indian type shales. This Station, as Station 14, is believed to be close to the contact between Zone 1 and Zone 2 of Upper Devonian. The tanned brown shale of Station 14 comprised the upper one-quarter of the cliff outcrop, and black semi-hard concretionary fracturing shale forms the lower three-quarters of the cliff. The concretions in the formations at this locality are not limy; they must be siliceous as they are hard and they are lighter grey colored than the weathered shale; there is no rust or yellow staining in the basal outcrop at this point. More resistive Hare Indian type shale was noted downstream from this point.

STATION 16 — Upstream from Station 15, is a brown carbonaceous zone; contains orange rusty weathering bands due to pyrite content; shale is still not limy, contains ironstone concretions. Above this zone again there are more resistive light grey to tan grey shales with light grey siltstone laminae that hold the formations up. None of the shales are calcareous or limy.

.STATION 17 — Upstream from Station 16. There is perhaps another 200 - 300 feet of section of the light grey shiny shale described at Station 16. This shale unit is topped with a topographic bench formed probably by a resistive siltstone bed; an upper unit outcrops above this resistive bed in a cuesta representing approximately 480 feet of shale in a cliff, the shale is tan weathering, micro-micaceous, with thin platy resistive beds comprising 30% of the section.

Summary of Outcrop at Stations 15, 16 and 17

Zone #1, (not complete), 560 feet of Hare Indian type black semi-resistive shales and upper orange weathering carbonaceous zone outcropping in the Lower Creek region, topped by Zone #2, 620 feet of relatively recessive brown and tan, light-grey shiny, shales that have fine siltstone laminae and ridge forming siltstone or limestone beds within them.

STATION 18 — Two miles due west of Iverson Lake. There is about 700 feet of section exposed on the banks of the creek. Outcrop consists of shale, brown, soft, and siltstone, light grey, of Zone #2 of Upper Devonian Age. These beds at the creek level weather much like Hare Indian with a considerable number of dark orange patches; attitudes of the bed 210° AZ/17° NW. Above the shale in the creek there are shales that are finely friable, soft, shiny, sericitic on bedding planes, containing sandstone beds one-half a foot in thickness; sandstones are medium grained, poorly cemented, argillaceous and slightly calcareous; soft brown pure shales continue to the top of the cliff. There are four or more one-half foot sandstone beds in the entire section. The scree slopes are shiny light grey, sericitic; the outcrop looks tan-grey with some orange color that is not prominent.

STATION 19 — Located on the south bank of the English Chief River immediately in front of the Iverson thrust. A view of the north bank of the English Chief River from this point does not reveal any reversal on the English Chief anticline. The beds appear to go under the thrust with a horizontal attitude.

The west scarp face of a ridge was traversed at this station; the top of the ridge was covered with a soft, green shale, with limestones, green-grey, medium to fine crystalline. Float on top of the outcrop on the ridge consisted of a brown sandstone; the shale laminae here had worm burrow-type fossils one-half inch in diameter and flattened. The top of the cliff was held up by a massive argillaceous, limy, green, soft sandstone-siltstone bed. The sandstone was fine grained, argillaceous, shaly and limy, and contained white laminations; a bench of recessive shale with limestone and shale and sandstone laminae comprised the next unit and the lower part of the cliff was resistive, scarp-forming again, consisting of siltstone, green, argillaceous, soft, medium granular; elevation differences from the top of the ridge to the creek below indicated a 1,000 foot section. The zones described above were each approximately 150 - 200 feet thick. The sediments of this section are interpreted to belong to Zone #2 of Upper Devonian Age and are graphically represented on Stratigraphic Section CDP-16.

UPPER DEVONIAN

SUMMARY OF OUTCROP DESCRIPTIONS

ZONE 1 Fort Simpson Formation - Unit 18 (G.S.C. Paper 61-13)

The basal unit referred to as "the Hare Indian Formation" was examined at Stations 4, 6, 10, 15 and 19. Other outcrop areas were observed from the air and are designated as this group on a colored map.

The unit consists of shale, coal black, carbonaceous, fissile, non-calcareous in the upper parts, but limy with ironstone concretions and limestone bands near the Nahanni limestone contact. The shale weathers grey to black, with rust and yellow streaks in patches from iron oxides.

ZONE 2 Map Unit 22 (G.S.C. Paper 61-13)

Sections representing this zone were examined at Stations 3, 11, 15, 16, 17 and 19. Fossils collected at Station 11 near the top of the zone indicate that this group is of Upper Devonian, Lower Famennian stage. The fossils represented in the collection include:

Cyrtospirifer Whitneyi
Leiorhynchus Walcotti &
Cyrtiopsis Nahanniensis

This group was also observed at several locations from the air and has a tan-grey or brown earthy weathering shale section with numerous resistive, slabby siltstone horizons within it. The zone is capped with final massive siltstone bed that marks the boundary with yellowish homogeneous shale of Zone 3 above it.

ZONE 3 Map Unit 25 (G.S.C. Paper 61-13)

This group was examined at Stations 7, 12 and 13. Several outcrops examined from the air indicate the zone to be comprised of thick shale of a yellow tan or green shade that may weather a purplish grey in part. The zone has minor thin resistive beds in the base and is capped by a resistive siltstone bed.

No section was seen to outcrop above this upper resistive bed in the English Chief Syncline, although topographic ridges suggest that there may be another group, or age of rocks present. The fossils collected at Station 13 include Cyrtospirifer sp. and Leiorhynchus sp. These fossils represent the Upper Devonian Famennian stage.

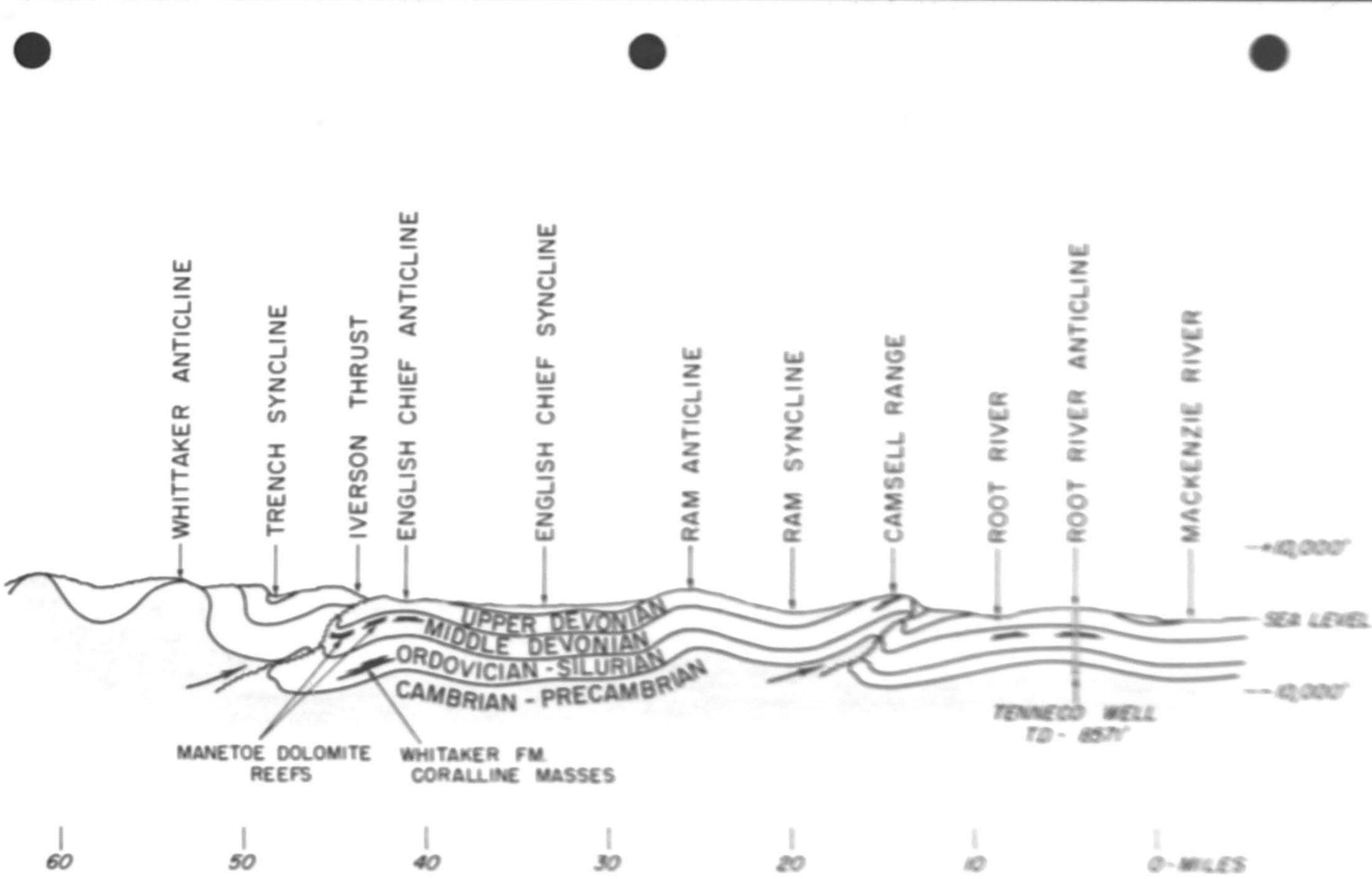
STRUCTURE AND TOPOGRAPHY

The Permits of the English Chief and Root River areas are located in a position that is transitional between two major topographic units; the interior plains and the Rocky Mountain Cordillera. East of the permits there are three narrow arcuate mountain ranges en-echelon in a general northerly strike. These mountains rise sharply from the peneplained interior plains to the east of them by means of near vertical thrust scarps. These thrust scarp mountains are considered to be within the interior plains province because the area between them and the Rocky Mountain Cordillera is not thrusted and mountainous. This inter-mountain area wherein the permits are situated, has been gently folded and uplifted from the interior peneplain. The relatively gently folded anticlines are believed to provide 2,000 - 3,000 feet of closure in the subsurface without rupture by thrust faulting. The terrain is generally underlain by soft Upper Devonian shales and is usually gently rolling and tree covered. Sharper folds and erosion have combined to expose Devonian carbonates in more rugged ridges and steep walled canyons in a minor portion of the area.

The topography then is directly related to structural conditions in the English Chief - Root River Area. The rugged Canyon Ranges of the Rocky Mountains form a massive topographic division immediately west of the Permit areas as they reflect the repeated thrust faulting from more acute diastrophism than experienced to the east in the interior plain.

Major east-west valleys of the North Nahanni, English Chief, Root River and Redstone rivers cut through the mountain and plain areas as tributaries to the north flowing Mackenzie River. These rivers are gently graded and their valleys are broad and gravel filled.

Access to the English Chief anticline from the Mackenzie river is estimated to be relatively good. The main hazard to roads constructed along the river valleys would be washout during periods of high volume runoff.



ROOT RIVER, N.W.T.

WEST TO EAST STRUCTURAL SECTION THROUGH PERMIT 3448

SHOWING

INTERPRETATION OF SUBSURFACE CONDITIONS BENEATH ENGLISH CHIEF ANTICLINE

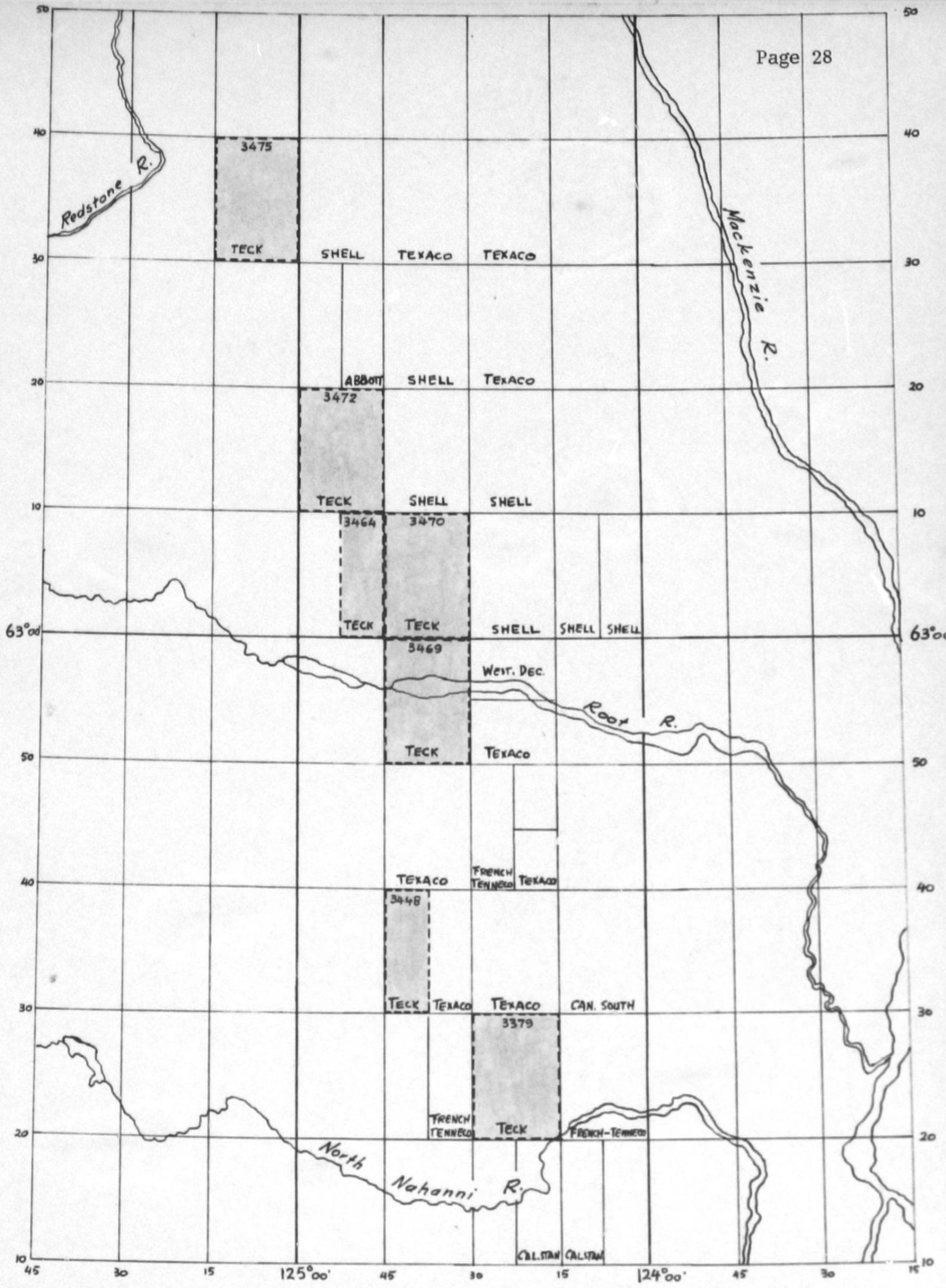
TECK CORPORATION LIMITED

SUMMARY OF PERMITS

ROOT RIVER AREA

NORTHWEST TERRITORIES

Permit No.	Area Acres	Acquisition Cost $	Interest	Next Obligation Date and Deposit Required
3379	59,310	6,524.10	Teck - 100%	Dec. 13, 1965 $ 17,793.
3448	29,490	nil	Teck - 100%	Dec. 14, 1965 $ 8,847.
3464	28,995	nil	Teck - 50% Oil & Gas Futures 50%	Nov. 10, 1964 $ 4,349.
3469	58,320	15,163.20	Teck - 50% Oil & Gas Futures 50%	Nov. 23, 1964 $ 8,748.
3470	57,990	78.00	Teck - 50% Oil & Gas Futures 50%	Nov. 23, 1964 $ 8,699.
3472	57,660	14,990.00	Teck - 50% Oil & Gas Futures 50%	Nov. 23, 1964 $ 8,649.
3475	56,996	78.00	Teck - 50% Oil & Gas Futures 50%	Nov. 23, 1964 $ 8,549.



ROOT RIVER AREA PERMIT MAP
NORTHWEST TERRITORIES

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Smith, V. Zay Areal Geology and Structural Interpretation Map, Root River Area, May 1963.

1

Panorama of Permit No. 3379 located southeast of Iverson Lake. View is to northeast from the southwest corner of the Permit. Shale and siltstones of Zones 1 and 2 of Upper Devonian Age underlie the subdued, tree covered terrain of this Permit.

2

View south from English Chief River showing terrain of Permit No. 3379. Iverson Lake in middleground is located near northwest corner of the Permit.

3

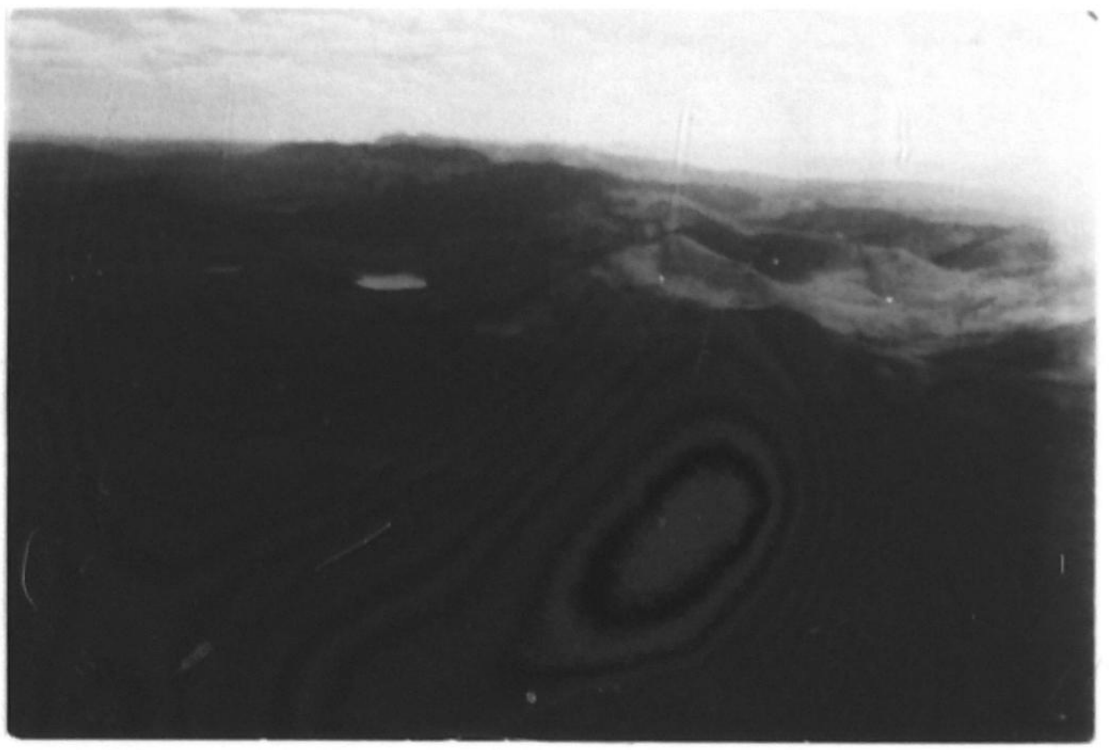
View northeast from the central area of Permit 3464 showing the sharp anticlinal structure of the Dahadinni range at this point. The ridge is Upper Devonian Limestones and the grassed valley is comprised of shales of the Ft. Simpson formation.

4

View to northwest from the southeast corner of Permit 3475 along the Dahadinni River. Section 8 was measured where the river cuts through the limestone ridge in middleground.

5

View to south across Permit 3472 from the north boundary. The small lake is on the geological map and can be used to correlate the picture with the mapped structure.



6

Close-up view of shale and siltstone zone #2 of Upper Devonian Age. The strata lies immediately above shales of the Fort Simpson Formation. This Kodachrome was taken in the upper 1/3 of Stratigraphic Section C.D.P. - 1.

7

Close-up view of shales and limestones of Zone #2 of Upper Devonian Age at Station #11 on the Root River.

8

View eastward from the junction of the Iverson Fault trace and the English Chief River. The ridge (Station #19 - Section C.D.P. - 16) contains shales, sandstones and limestones of Zone #2 of Upper Devonian Age. The strata is flat lying and comprise the west limb of the English Chief anticline.

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Close-up view of shale and siltstone zone #2 of Upper Devonian Age. The strata lies immediately above shales of the Fort Simpson Formation. This Kodachrome was taken in the upper 1/3 of Stratigraphic Section C.D.P. - 1.

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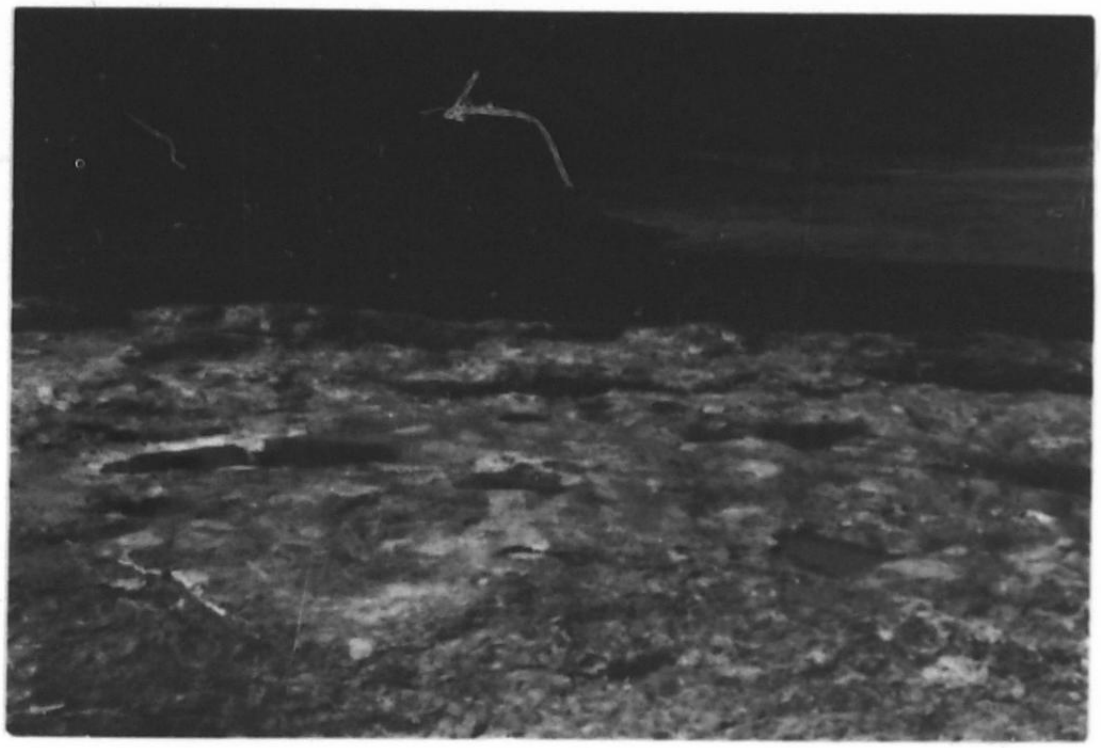
9

View of Nahanni - Fort Simpson Contact at Station 6 on North Nahanni River.



10

Close-up view of basal, limy shale beds of Fort Simpson Formation at Station 6. North Nahanni River.

11

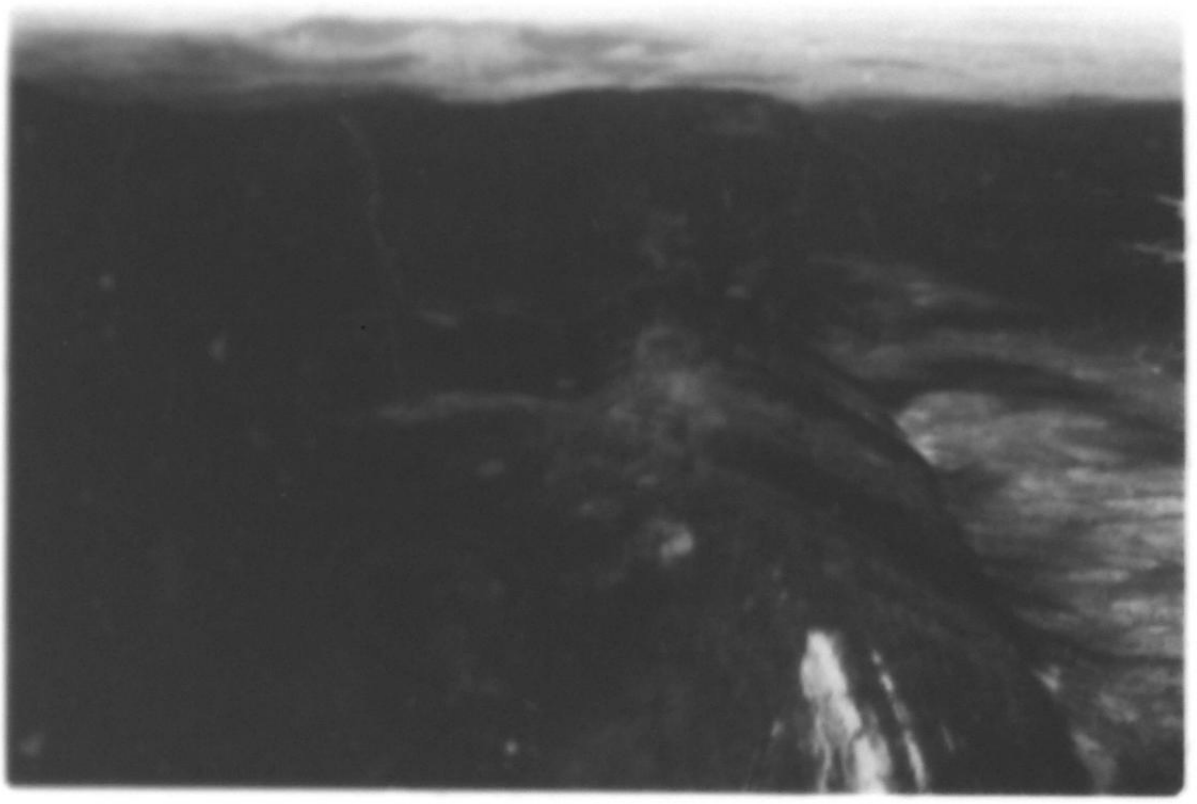
View of northwest of Dahadinni Canyon of Permit 3475. River cuts shales of Fort Simpson Formation along the axis of a Syncline.

12

View of outcrop described at Section 8. The top of this north wall of the Dahadinni Canyon was traversed.

13

View of northeast from southeast side of Permit 83475. Section 8 was measured at right middleground. Sharp anticline structure is evident in bedding of Nahanni, Headless and Landry Formations in foreground.



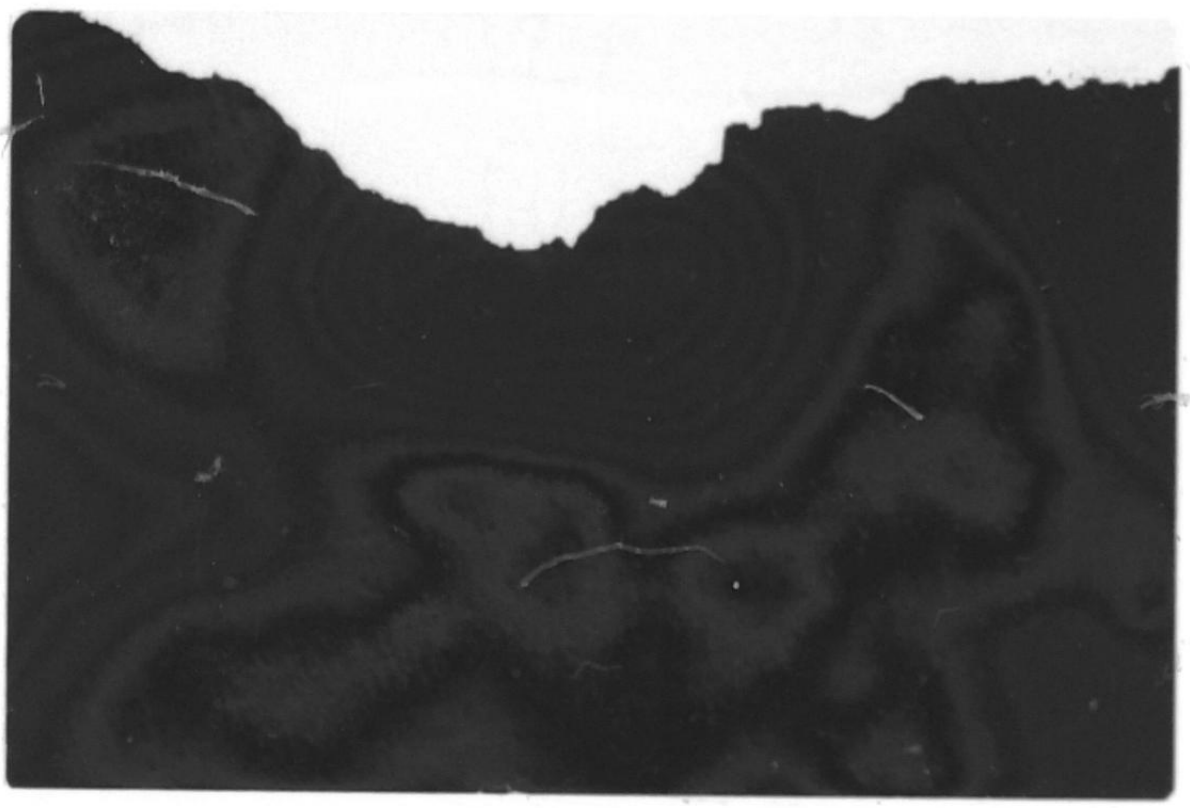
14

View to northwest along west side of Trench Lake Valley. English Chief River is foreground. The serrated sharp ridge results from the erosion of vertical beds of the Landry Formation. The shaly, recessive Headless and Funeral formation and the dark grey Arnica Formation can be readily delineated in this view.

15

Close-up view of the basal beds of the Landry Formation at Section 21. Recessive Funeral Formation shales underlie scree slope to left of the massive limestone of the Landry.

16



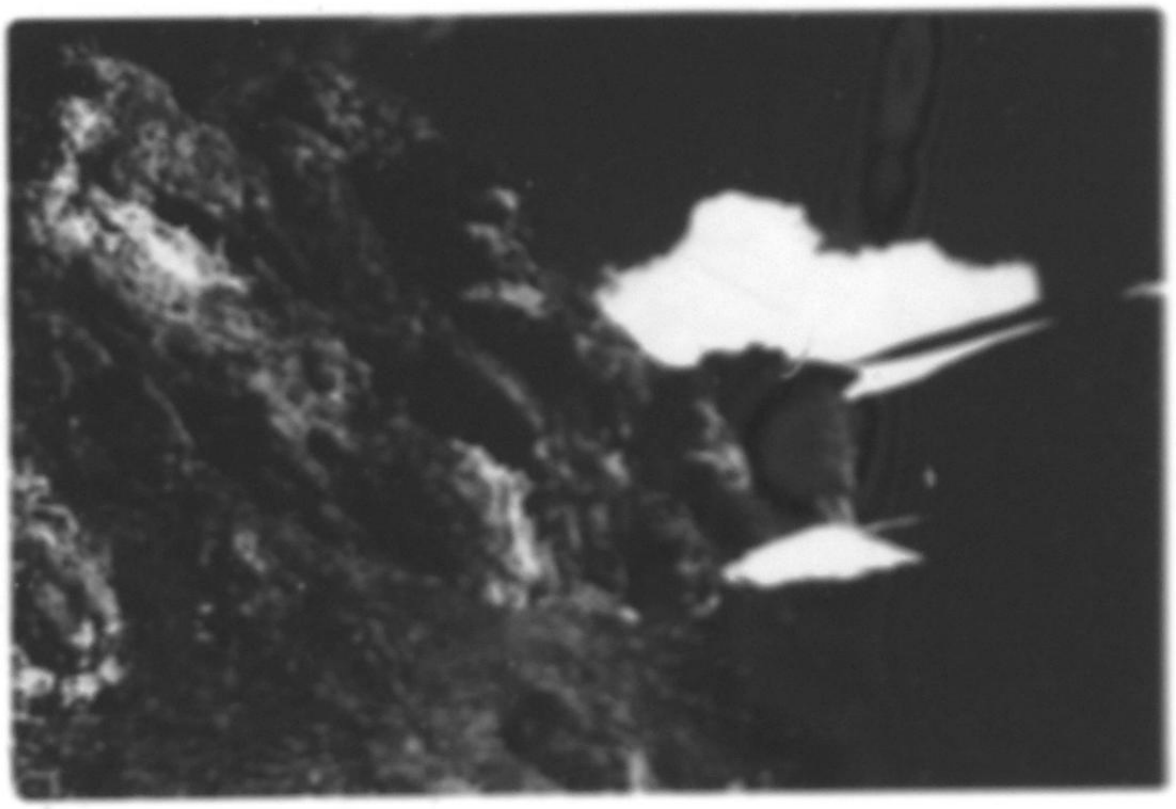
View North as above, showing recessive zone of the Headless Formation, stratigraphically above the Landry Formation - Sec. 12.

17

Close-up view of porous dolomites of the Manetoe Formation Section 3. An indication of bedding is evident on the left side of this outcrop, but generally the formation is of a "massive reef" nature.

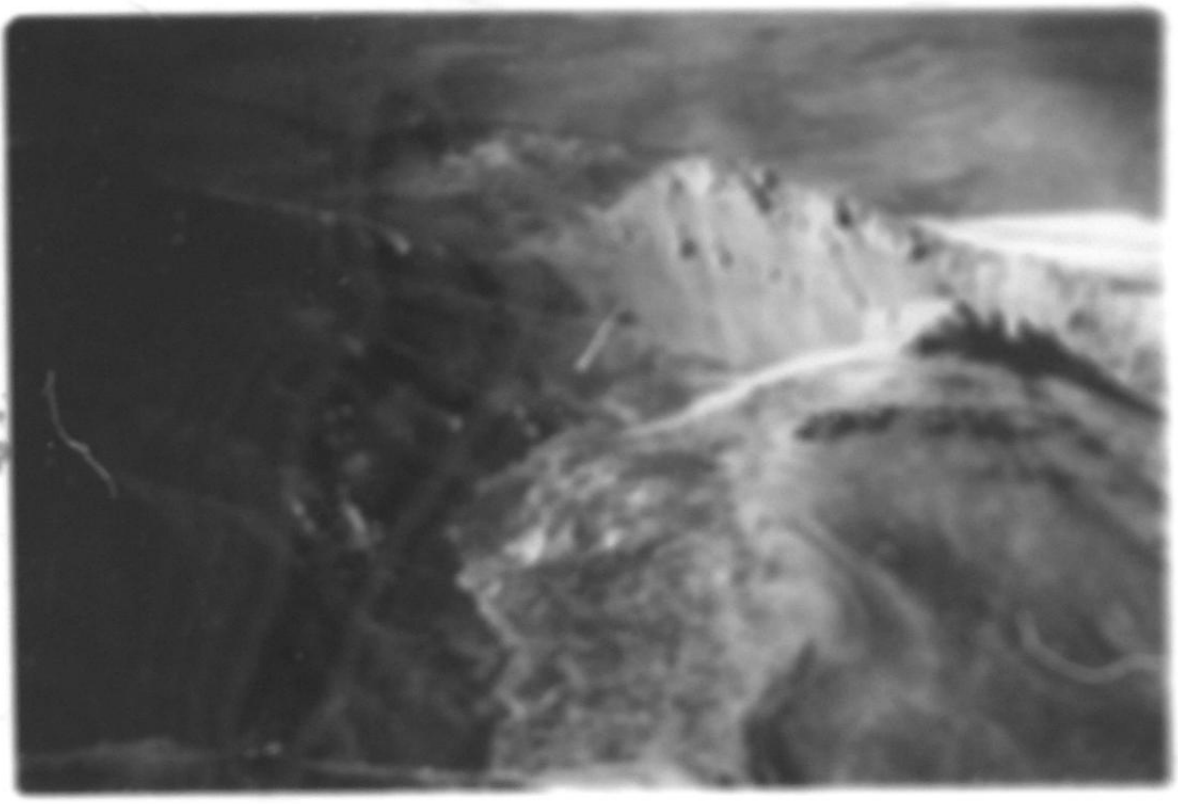
18

Another view of Manetoe Formation in Section 3. Massive bedding is suggested in the outcrop. The dip is 20° east away from viewer.



19

An areal view of a "patch reef" outcrop of Manetoe Formation within an environment of Funeral shale. Location is six miles southwest of Sec. 3. Nahanni Limestones outcrop on west dip slope to the right in the Kodachrome.



20

A view to the northeast of the general location of Section 3. The irregularly resistive Manetoe Formation outcrops below the recessive thin Headless Formation. In the right foreground the Southern pinchout of the "Manetoe Reef" within the Funeral Shales can be seen.

21

Close-up northeast view of the Manetoe Formation. The recessive Headless Formation is well expressed in this photo as it was above. The northward termination of the Manetoe can be seen in this photo.

22

An eastward view of Section 3 showing from top to bottom the Nahanni, Headless, Funeral and Manetoe Formation.

23

View East across Sec. 4 includes the dark grey Arnica Formation and the light grey weathering Sombre Formation on which the helicopter is sitting. Funeral shales and Landry limestones form the ridge in the background.

24

View northwest across Section 13. Picture includes the entire Camsell Formation. The Camsell generally forms a resistive yellowish weathering ridge as illustrated in this Kodachrome.

25

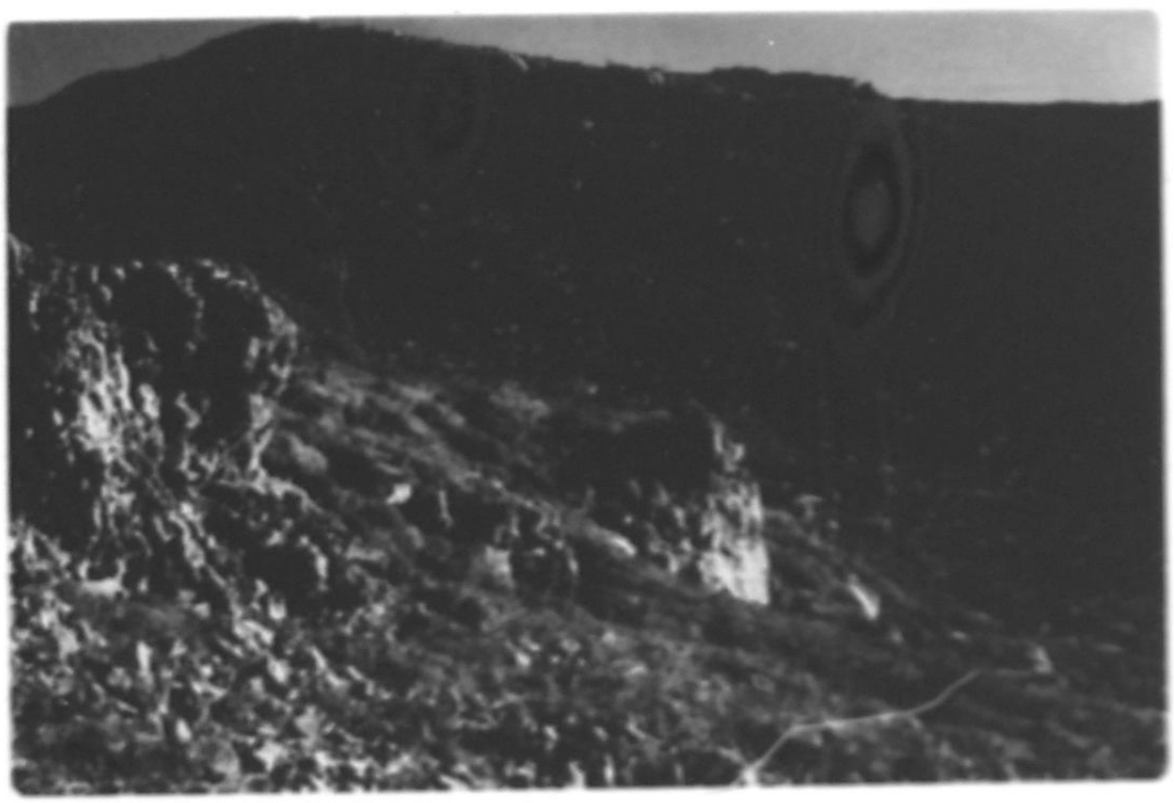
View north across Sec. 5 shows shaly brown grey nature of outcrop of Delorme Formation (Main Large Ridge in Middle-ground). The west flank of the Camsell Formation ridge is present at extreme right in the picture.

26

View to southeast of dark grey weathering Arnica Formation at Section 10. High peak on ridge is Mount Lyle located near south boundary of Permit #3472.

27

Close-up view of porous coarse crystalline dolomite of Sombre formation near axis of anticlinal structure of Section 10. Sample 1030 on Strat. Section.



28

Close-up view of the shales in the Upper Whittaker Formation. This outcrop is at Sample #6401 on the stratigraphic column of Section 6 & 14.

29

Close-up view of Flaggy Dolomite and Shale of Lower Delorme Formation Sample #2508 on Strat. Section 5.

IVERSON LAKE

Prepared for Teck Corporation Limited
Canadian Devonian Petroleums Division

Co-Ordinates : 62° 26' N. - 124° 11' W
Geographic Location : 2 Miles SE of Iverson Lake (130° AZ.)

Geologists : C.D. Mc Cord, K.W. Campbell.
Date of measurement : June 8, 1963

FOSSIL SYMBOLS

F	Fossiliferous		Stromatopora
B	Brachiopoda		Foraminifera
G	Gastropoda		Crinoid
	Coral		Algae

POROSITY SYMBOLS

x	intergranular, intercrystalline, interfragmental
v	vuggular (greater than 1/16 mm)
f	fractured
p	pinpoint
•	oil stained or petroliferous

LITHOLOGICAL SYMBOLS

Limestone	Silty Limestone	Shale	Siliceous
Dolomite	Limestone Breccia	Calcareous Shale	Siltstone
Dolomitic Limestone	Dolomite Breccia	Anhydritic Shale	Ironstone
Argillaceous Limestone	Rugose to Rubbly	Salt Casts	Sandstone
Argillaceous Dolomite	Coarse Crystallization	Pyritic / Micaceous	Chert, light or dark

AGE	FORMATION	SECTION THICKNESS	FORMATION THICKNESS	LITHOLOGICAL LOG	COLOUR	FOSSILS	POROSITY (POOR / FAIR / GOOD / VG)	SAMPLE NUMBER	DETAIL LITHOLOGICAL DESCRIPTION	LITHOLOGICAL SUMMARY	PALEONTOLOGICAL RECORD
UPPER DEVONIAN	ZONE 2 - (Unit 22 - G.S.C.)								Siltstone - olive grey, limy, thin bedded, shale laminae. Shale - olive green soft serricitic non calc. brown weathering, black when wet. Siltstone - olive green, limy, cliff forming. Shale - soft, laminated green and brown grey, with occ. very thin siltstone laminae less than 1/8 inch thick. Non calc. except at base at creek level where occ. limy black concretion occurs. Conceidal fracturing and rusty weathering characteristic of basal zone. Downstream the base of the section is revealed to be harder black siliceous, slabby shale. Sharp edges and coal black characteristics are quite different from overlying section. Rusty streaky weathering has similar characteristics to Kare Indian Formation Shales where they outcrop in the Nahanni River Canyon and are resting on Nahanni Limestone.		

MIDDLE DEVONIAN

HEADLESS FM.

MANETOE FM.

1200	Limestone - brownish grey, granular, massive bedded, (one bed 30 feet thick), many large colonial coral fragments, weathers like a breccia.	160' Limestone - brown grey to black, finely crystalline, to finely sucrose, argillaceous, abundant fossils, thick bedded, rubbly, very light grey weathering, covered intervals possible shale beds.	Fossil Flora: Diaphyllum sp. Favosites alpenesis Cladopora (Middle Devonian)
1267			
1347	Limestone - as above, black, finely crystalline to sucrose, fossiliferous.		
	Limestone - as above, argillaceous, fossiliferous, weathers very light grey.		
1474			
1555	Limestone - brown, crpxl, , (10 foot thick bed,).		
	Limestone - black, granular.	140' Limestone - blue-grey, crpxl, argillaceous, thin bedded to platy, weathers buff.	
1655	Limestone - blue-grey, finely crystalline, argillaceous, platy , weathers buff.		
1712	Limestone - as above		
	Limestone - black, crpxl, trace of vertical striations from movement within beds.		
1882			
	Limestone - brownish grey, crpxl, , thick bedded, (1 foot to 3 feet), occasional 1 foot, lime , shale bed.	60' Limestone - brown to black, argillaceous, crpxl., siliceous, thick bedded, trace of lime shale.	
1922			
	Limestone - black, as above, argillaceous, quite siliceous, concoidal fracture, interbedded in part with light tan limestone, siliceous.		
2082			
	Dolomite - white, coarse crystalline, thick bedded, coarse inter-crystalline and vuggy porosity, malachite staining, weathers white, rounded, (granite like), with occasional bed black limestone as above.	140' Dolomite - white, coarse crystalline with inter-crystalline and vuggy porosity, thick bedded, weathers white, rounded.	
2282			
2482	Dolomite - black, granular, with white, coarse crystalline, tiny dolomite infilling vugs, patchy porosity.		
		110' Dolomite - black, granular, coarse crystalline; patchy, vuggular, and inter-crystalline porosity.	
2682	Dolomite - brown to black, granular, in part vuggy, grades from vuggy at top to medium crystalline, buff grey, dense at base.		
2882	Dolomite - black, coarsely crystalline, in part inter-crystalline porosity.	50' Dolomite - inter-bedded, dense, crpxl. and granular, vuggy.	
	Dolomite - interbedded, tan, argillaceous, dense, and brown grey, granular, vuggy. Weathers as step falls in creek.		
3082	Dolomite - black, medium crystalline, dense, trace of vuggy beds as above, in part argillaceous stratifications.	80' Dolomite - black, medium crystalline, dense, argillaceous.	
3282			
	Dolomite - black - grey, finely crystalline, dense, becoming siliceous and lime		
		140' Dolomite - black, finely crystalline, dense, siliceous and limey.	
3612	Limestone - brown, sucrose, vuggular, cliff forming.	20' Limestone - sucrose.	
	Dolomite - stratified black, buff and brown, limy dolomite with blebs of calcite, weathers dark grey and salmon color. (calcite), cliff forming.	170' Dolomite - black, buff and brown, lime, with calcite blebs, cliff forming.	
3812			
3857	Base of [illegible] outcrop.		

2 OF 2

MIDDLE DEVONIAN

HEADLESS

MANETOE FM.

200 — 300 — 320 — 100 — 1,000 — 200 — 300 — 400 — 500 — 600 — 1,00 — 700 — 800 — 900 — 900

1100

covered bench-probably shale zone and possibly also some brecciation resulting from movement within limestone beds.

320' Limestone - dark grey to tan grey at top of formation; crpsl, siliceous, org. mostly contains calcite filled fractures.

96 Limestone - dark grey as above, in part brecciated, with calcite patches.

1165 Limestone - partial outcrop is recessive shail, black, crystl, , siliceous, with calcite filled fractures and slickensides on vertical planes similar to cone and cone structure.

1230 Dolomite - black, coarse crystalline, with inter-crystalline and vuggy porosity, thin pseudo-bedding in top five feet, then massive, rubbly weathering below.

1430 Dolomite - as above, becoming light grey and more rubbly, pseudo-bedding, dip 20 degrees to the east

Covered interval.

1550

Dolomite - black, coarse crystalline, with abundant veining and patches of white coarse crystalline dolomite, also coarse clear crystalline quartz in larger vugs.

1750

Dolomite - buff, coarse crystalline, with white dolomite patches as above. No bedding discernible.

1950

Dolomite - dark grey, porous, with occasional band of pure white, vitreous, coarse crystalline dolomite.

2150

Dolomite - continuous reef-type outcrop as above.

2350

Dolomite - continuous outcrop as above, no definite bedding, fracturing common with variously oriented planes.

2550

No dip or strike of original fold in the Devonian formations.

2656

This general impression of a roll over is gained from viewing the reef section from the top of the funeral shale outcrop to the west.

Dolomite - black coarse crystalline, not as vuggy, not as granular as above.

fault zone probably strikes along the stream course.

Immediately west of creek an outcrop of funeral formation was examined : 250 feet of shale and limestone, limestone is black, lithographic, microcrystalline, granular, platy, very argillaceous, with beds and laminae of shale. The shale is fine, soft. Both limestone and shale weather irregularly platy , brown weather characteristic similar to a shale slope, dip of west.

250' Shale and limestone - limestone black, crypto, slim granular, beds, very argillaceous, platy, with beds and laminae of soft, clay shale.

The outcrop is tentatively as this, the Devonian reef section in the lower 250 feet of section described above. For this reason and with consideration of the reversal of attitude on west dipping fault is supposed at the creek contact.

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ROOT RIVER AREA
NORTHWEST TERRITORIES
STRATIGRAPHIC SECTION C.D.P. - 4
WHITTAKER RANGE

C.D.P.-4

Prepared for Teck Corporation Limited
Canadian Devonian Petroleums Division

Co-Ordinates : 62° 35' N - 124° 50' W
Geographic Location: 7 Miles NW of Trench Lake (332° AZ.)
Geologists : C.D. Mc Cord, K.W. Campbell
Date of measurement: June 10, 1963

FOSSIL SYMBOLS

- F Fossiliferous
- B Brachiopoda
- G Gastropoda
- Coral
- Stromatopora
- Foraminifera
- Crinoid
- Algae

POROSITY SYMBOLS

- x intergranular, intercrystalline, interfragmental
- v vuggular (greater than 1/16 mm.)
- f fractured
- p pinpoint
- • oil stained or petroliferous

LITHOLOGICAL SYMBOLS

Limestone	Silty Limestone	Shale	Siliceous
Dolomite	Limestone Breccia	Calcareous Shale	Siltstone
Dolomitic Limestone	Dolomite Breccia	Anhydritic Shale	Ironstone
Argillaceous Limestone	Rugose to Rubbly	Salt Casts	Sandstone
Argillaceous Dolomite	Coarse Crystallization	Pyritic Micaceous	Chert, light or dark

AGE	FORMATION	SECTION THICKNESS	FORMATION THICKNESS	LITHOLOGICAL LOG	COLOUR	FOSSILS	POROSITY (POOR, FAIR, GOOD, VG)	SAMPLE NUMBER	DETAIL LITHOLOGICAL DESCRIPTION	LITHOLOGICAL SUMMARY	PALEONTOLOGICAL RECORD
	FUNERAL FM.								Section above is covered Funeral Formation Shales. Limestone - black, very fine crystalline, dense, dolomitic, slight siliceous, very argillaceous, fossiliferous, weathers very dark grey.		
		100						76	Limestone as above, thin bedded, interbedded with shale. Dolomitic limestone beds 4--6" thickness with 2 inch shale laminae between.	335' - Limestone and shale interbedded. Limestone - black very fine crystalline, dense, dolo, sl. siliceous, concoidal fracture, fossiliferous, weathers dark grey. Shale - black, limy, weathers tan and dark grey.	
		200							Interval covered with shale scree - Shale black, weathers tan, but overall effective color is dark grey.		
		300						276			
		335									
MIDDLE DEVONIAN	ARNICA FM.								Dolomite - black, very fine granular - argillaceous, micro-micaceous, with white coarse crystalline dolomite in veinlettes - brecciation by veinlettes in part, crinoid stems common, resistive.		
		100						476	Dolomite as above, with oval black chert inclusions, thick bedded.	290' - Dolomite - black, very fine granular - (arg.), in part micro-micaceous, in part brecciated by interlaced veinlettes of coarse crystalline white dolomite. Crinoid stems common. Black chert inclusions in lower half.	
		200									
		300						676	Interval mostly covered but semi-resistant.	170' - Covered interval. Probably thin bedded, argillaceous dolomite as below.	
		400									
		500						876	Dolomite as above, with white dolomite veins and black chert, thin 1--4 inch beds separated by shale laminae that weather with hematitic red color in part.	60' - Dolomite - black, very fine granular, thin bedded, with shale laminae.	
		600							Dolomite - dark grey, very fine crystalline, occasional band thin bedding as above, with numerous shale fractures paralled to bedding spaced at 1--3 inch intervals. Occasional interbed of light grey dolomite with angular laminations, weathers with red hematitic color as above. Coarse crystalline white dolomite is present in patches, veining is sparce. Outcrop weathers quite dark grey.	160' - Dolomite - dark grey, very fine crystalline, thick bedded and thin bedded in bands. Shale parting planes and laminae, in part red weathering bedding planes. Dark grey weathering.	
		680						1086	Unconformable contact	Probably the upper two divisions of the Sombre Formation have been eroded at this section location.	
									Dolomite - medium grey, granular, argillaceous.		
									Dolomite - blue grey, calcareous, thick bedded, with zones of shale fractures as above, weathers a medium light grey.		
		100						1224	Fossil beds - coral-? - appear as calcite filled, isolated worm burrows.	375' - Dolomite - medium blue grey, thick bedded, with zones of shale fractures and fossil horizons. Banded weathered surfaces of light and dark grey beds.	Amphipora sp. Middle Devonian
		200							Dolomite - Interbedded light and dark grey, fine to very fine crystalline, thick 3 foot beds. Banded weathered surface of light and dark grey, reflects variable argillaceous content of dolomite beds.		
		300						1424			
		400						1484	Dolomite - green grey, cryst., massive bedded, friable, siliceous with interbeds of dolomite dark grey, very fine crystalline, thin bedded.		
		500						1624	Shale - light green grey, dolomitic, tan weathering.		
									Dolomite - green grey, cryst., massive bedded with shale, as above, as occasional interbed.	710' - Dolomite - green grey and medium blue grey interbedded and banded, with shale laminae on parting planes in cyclic zones. Shales are brown and light green-tan weathering with	
		600						1721			

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2 of

MIDDLE DEVONIAN

SOMBRE FM.

3 of 3

SOMBRE FM.

700
800
900
1000
1100
1200
1300
1400
1500
1600
1700
1755

2000
2500
3000

1921 — Dolomite - interbedded as above, medium light blue grey, [illegible], occasional bed of brown, sandy dolomite in float on covered interval, thin shale laminae separate massive dolomite beds in 15--25 foot intervals.

2061 — Dolomite - medium light grey, fine crystalline, weathers light and dark grey, banded, some beds laminated on weathered surfaces, resistative. Thick bedded 1--4 foot thickness.

2261 — Dolomite - granular - porous.

2349 — Dolomite - medium grey, granular, porous, 2 foot bedded, trace of corals, crinoids and trilobites.

Dolomite - granular as above - softer with duller sound than fine crystalline dolomite.

2461 — Dolomite - granular as above.

Dolomite - light and dark grey, crypxl. to very fine crystalline.

Covered interval=possible breccia zone as in beds bordering it.

Dolomite - as above variable color and crystalline size dependant on argillaceous content.

2661 — Dolomite - granular, porous.

Dolomite - interbedded as above, much brecciated float in saddle and in outcrop on each side.

2861 — Dolomite - very argillaceous, tar weathering on occasion, thin bedded.

Dolomite - blue grey, very fine crystalline.

Dolomite - granular, porous.

2998 — Limestone - breccia - fragments of angular dark blue grey limestone and medium grey, powdery limestone.

Weathers light grey with yellow and orange colors on calcite patches and veins. Weathers rounded and rubbly - in part massively bedded.

200' - Dolomite - medium grey, granular with intergranular porosity, softer and less brittle than dolomite above. Fossiliferous, corals and crinoids.

465' - Dolomite - massively bedded, variable color, and crystalline to crypxl. Banded weathered surface, with breccia zones and occasional isolated bed of granular porous dolomite as above.

Dechenella sp. (Lower or Middle Devonian)

70' - Limestone - breccia.

CAMSELL FM.

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ROOT RIVER AREA
NORTHWEST TERRITORIES
STRATIGRAPHIC SECTION C.D.P. - 5
WHITTAKER RANGE

C.D.P.-5

Prepared for Teck Corporation Limited
Canadian Devonian Petroleums Division

Co-Ordinates : 62° 34' N. - 124° 51' W.
Geographic Location : 6.5 Miles NW of Trench Lake (324°AZ.)

Geologists : C.D. Mc Cord, K.W. Campbell
Date of measurement: June 10, 1963

FOSSIL SYMBOLS

F	Fossiliferous	≡	Stromatopora
B	Brachiopoda	∇	Foraminifera
G	Gastropoda	⊙	Crinoid
⚘	Coral	⛰	Algae

POROSITY SYMBOLS

x	intergranular, intercrystalline, interfragmental
v	vuggular (greater than 1/16 mm)
f	fractured
p	pinpoint
•	oil stained or petroliferous

LITHOLOGICAL SYMBOLS

	Limestone		Silty Limestone		Shale		Siliceous
	Dolomite		Limestone Breccia		Calcareous Shale		Siltstone
	Dolomitic Limestone		Dolomite Breccia		Anhydritic Shale		Ironstone
	Argillaceous Limestone		Rugose to Rubbly		Salt Casts		Sandstone
	Argillaceous Dolomite	*	Coarse Crystallization	P M	Pyritic Micaceous		Chert, light or dark

AGE	FORMATION	GROSS THICKNESS	FORMATION THICKNESS	LITHOLOGICAL LOG	COLOUR	FOSSILS	POROSITY	SAMPLE NUMBER	DETAIL LITHOLOGICAL DESCRIPTION	LITHOLOGICAL SUMMARY	PALEONTOLOGICAL RECORD
MID. DEVONIAN	CAMSELL FM.	800	700					200	Limestone Breccia - lt tan grey, granular to crypln, massive bedded, orange weathering calcite matrix with org inclusions.	200' Limestone Breccia - lt tan grey, granular to crypln, massive bedded, Orange weathering calcite matrix in breccia.	
UPPER DELORME FM.		1100	800					400	Limestone - white, f xln, laminated, wavy, flaggy rubble results from abundant shale laminae on bedding planes. Occasional breccia zone. Whole section stained yellow cream color on weathered surface. Limestone - as above, flaggy, wavy bedded, intermittant outcrop suggests interbeds of shale. Some of outcrop grades from very argillaceous limestone to limy shale.	450' Limestone - lt grey to white, f xln, laminated, variable org content, uneven shaly bedding planes, this bedded, flaggy weathered debris. Grades to limy shale with shale beds probable in covered areas. Section weathers a yellowish cream color.	

1 of 4

UPPER DELORME FM.
MIDDLE DELORME FM.
LATE SILURIAN

Limestone - white, f xln, laminated, wavy, flaggy rubble results from abundant shale laminae on bedding planes. Occasional breccia zone. Whole section stained yellow cream color on weathered surface.

Limestone - as above, flaggy, wavy bedded, intermittant outcrop suggests interbeds of shale. Some of outcrop grades from very argillaceous limestone to limy shale.

Dolomite - lt grey, f xln, siliceous, platy to slabby, with occasional coarse xln qtz vein.

Dolomite - dk blue grey to black, granular, org, weathers dark grey with rust colored oxides. Formation has a yellow appearance from a distance. No lt grey beds or brilliant yellow patches as in Cambrell formation above.

Dolomite - as above, limy, fossiliferous, becoming more rubbly due to wavy shale laminae and sand-spheres. Occasional thin, limy beds have abundant bulbous brachiopods and bryozoan. Ripple marked bedding surfaces on two inch thick flagstones. Limy brown shale laminae.

Dolomite - dk grey to black, micro xln, limy, very fossiliferous in specific beds that could be considered dolo limestone. Fossils collected at 1200'.

Dolomite - dk grey, f xln, arg, flaggy, fossiliferous, limy. Shale zones suggested by alternating resistive beds and covered zones in 20 foot intervals. Fossils collected at 1375.

Dolomite - as above, nodular, wavy, dolomite flagstone in scattered outcrop, some coarse xln calcite in veins, no fossils.

Dolomite - as above, dk blue grey, thinly laminated.

Dolomite - as above, dk grey to black, siliceous, with black chert.

Dolomite - as above black limy, yellow weathering, fossiliferous, slabby.

Covered Interval - rusty covered dolomite debris.

Color change on ridge to north.

Dolomite - med grey, f xln, smooth bedding planes, not limy, not fossiliferous.

Dolomite - as above, uneven flaggy, 3 - 4 inch bedding, fossiliferous.

450' Limestone - lt grey to white, f xln, laminated, variable org content, uneven shaly bedding planes, this bedded, flaggy weathered debris. Grades to limy shale with shale beds probable in covered depression. Section weathers a yellowish cream color.

200' Dolomite - lt grey to lt dk grey, f xln to granular, siliceous in upper beds at formation boundary, with occasional quartz veins. Lower beds org with rust colored iron oxides. Entire section has a pale yellow appearance from a distance.

Gastes sp.
Nagambonia arculoidea
(L Devonian or latest sil.)

Nagambonia arculoidea

Strophomenta sp.
(L Devonian or latest sil.)

290' Dolomite - limy, dk grey, f xln, org, shale laminae, uneven thick flaggy beds, fossiliferous, interbedded with beds that could be considered dolomitic limestone. Possible shale zones in covered intervals. Calcite veins noted.

240' Dolomite - not limy, dk grey, f xln, nodular, wavy flaggy stone. Debris, thinly laminated argillaceous, with calcite veins, no fossils.

100' Dolomite - dk grey, to black, siliceous with black chert, resistive outcrop.

80' Dolomite - limy, black, fossiliferous, slabby, in part siliceous, weathers yellow.

170' Recessive covered interval with rust colored dolomite debris, small outcrop in not limy, not fossiliferous, med grey, f xln.

100' Dolomite - med grey, f xln, fossiliferous, not limy.

2 of 4

SILURIAN (Probably Ludlovian - G.S.C. Paper 61-13)
LOWER DELORME FM. (Reefal in Delorme Range - G.S.C. Paper 61-13)

1 of 4

Limestone - black, rubbly, platy, irregularly mottled purple color.

Covered interval probably thin, platy, argillaceous, limestone, or limy shale as in the float; purple color reflects minute shale laminae.

Limestone - black, argillaceous, platy, weathers rubbly, mottled purple color from uneven laminae of very arg limestone. Coarse xln qtz and iron sulphides present.

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2

SILURIAN (Probably Ludlovian - G.S.C. Paper 61-13)
LOWER DELORME FM. (Reefal in Delorme Range - G.S.C. Paper 61-13)

3 of

SILURIAN (Probably Ludlovic
LOWER DELORME FM. (Reefal in Delor

4 of 4

2 of

This outcrop is topographically as high as the ... lower 250 feet of section described above. For this reason and with consideration of the reversal of attitude an west dipping fault is proposed at the creek contact.

280' Shale and limestones - limestone black, crpxl. also granular, mmic, very arg., platy, with beds and laminae of soft, limy shale.

3 of 3

ROOT RIVER AREA
NORTHWEST TERRITORIES
STRATIGRAPHIC SECTION C.D.P. - 6 & 14
WHITTAKER RANGE

C.D.P.-6 & 14

Prepared for Teck Corporation Limited
Canadian Devonian Petroleums Division

Co-Ordinates 62° 01' N - 124° 55' W
Geographic Location 6 Miles W of Trench Lake (280°AZ)

Geologists : C.D. McCord, K.W. Campbell
Date of measurement: June 11 & 17, 1963

FOSSIL SYMBOLS

- F Fossiliferous
- B Brachiopoda
- G Gastropoda
- Coral
- Stromatopora
- Foraminifera
- Crinoid
- Algae

POROSITY SYMBOLS

- x intergranular, intercrystalline, interfragmental
- v vuggular (greater than 1/16 mm)
- f fractured
- p pinpoint
- • oil stained or petroliferous

LITHOLOGICAL SYMBOLS

Limestone	Silty Limestone	Shale	Siliceous
Dolomite	Limestone Breccia	Calcareous Shale	Siltstone
Dolomitic Limestone	Dolomite Breccia	Anhydritic Shale	Ironstone
Argillaceous Limestone	Rugose to Rubbly	Salt Casts	Sandstone
Argillaceous Dolomite	Coarse Crystallization	Pyritic Micaceous	Chert, light or dark

AGE	FORMATION	SECTION THICKNESS	FORMATION THICKNESS	LITHOLOGICAL LOG	FOSSILS	POROSITY	SAMPLE NUMBER	DETAIL LITHOLOGICAL DESCRIPTION	LITHOLOGICAL SUMMARY	PALEONTOLOGICAL RECORD
								Shale - Outcrop immediately above considered to be Lower Delorme Formation, medium dark grey, ..., irregularly laminated, orange weathering, sword shape rather than slab shape debris. See base of Section 3.		Favosites cf capax (Upper Ordovician or Lower Silurian)
								Shale - scree slope, blocky, dark grey-black, ..., with limestone, argillaceous, crypt.		
								Shale - with limestone scree, as above, blocky, black to dark grey weathering.		
								Shale - with limestone scree, as above, trace of veins and patches of calcite, also thin beds of shell fragments.		
								Shale - black, carbonaceous appearing, ..., not as ... as below.		

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LOWER SILURIAN
UPPER WHITTAKER FM.

Depth	Sample	Detail Lithological Description	Lithological Summary	Paleontological Record
300	1400			
400		Shale - with limestone scree, as above, trace of veins and patches of calcite, also thin beds of shell fragments.		
500	1200	Shale - black, carbonaceous appearing, ..., not as ... as below.		
	1170	Base of resistive ... above, recessive saddle below.		
600		Covered saddle.		
700	1000	Covered saddle brown earth forming shale zone, no outcrop, mostly soil with ... weathered, small, platy, shale debris.	1350' Shale - med dk grey, weathers lt tan to dk grey, ..., platy in lower portion, blocky at top. Trace of calcite filled fractures, also thin beds of calcitic shell fragments. Some variability in composition of shale reflected in weathered characteristics, alternating zones of black, sl. siliceous, sha.- and soft, brown, earth forming shale. Entire zone recessive.	
800	800	Litho change, tan weathering, ... shale above, dark grey weathering debris below.		
	608	Limestone - resistive, black, finely crystalline. Shale - black, no brown tinge as above, siliceous?, ...		
900	530	Litho change - dark grey to black float above, brown weathered float below.		
1000		Covered slope - all float that appears very close to being in situ.		Nautiloid - worm tubes (Ordovician - Silurian)
1100		Shale - ..., platy with occasional blocky slab that also breaks in platy fashion, weathers tan-brown, in part fossiliferous.		
1200	200	Shale - dark grey and medium grey, ..., with calcite on bedding planes, numerous, (siliceous), semi-platy.		
1300		Covered saddle.		
1400	6301	Shale - black, platy, sonorous, (siliceous), weathers light tan grey, ... black when wet.		
1500		Shale - as above.		
1550	5951	Shale - as above, with occasional thicker, ... dolomite bed. Discontinuous outcrop.		
100	5701	Shale - debris quite platy, black, thin, smooth.		

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E. ORDOVICIAN
MIDDLE WHITTAKER FM. (Reefal in Canyon Ranges)

FM.

Limestone - black, ... stained to granular, argillaceous texture, light grey weathering, massive bedded, but quite fractured. Fossiliferous, crinoid stem recognized.

...' Limestone, black, crpxln, siliceous at top, argillaceous in lower 2/3 of section, massive, irregular bedding, fossiliferous. Trace of thin platy arg limestone,

MIDDLE
FM.

ROOT RIVER AREA
NORTHWEST TERRITORIES
STRATIGRAPHIC SECTION C.D.P. - 9
RAHADINNI RANGE

C.D.P.-9

ROOT RIVER AREA
NORTHWEST TERRITORIES
STRATIGRAPHIC SECTION C.D.P. - 7
CANYON RANGES

C.D.P-7

Prepared for Teck Corporation Limited
Canadian Devonian Petroleums Division

Co-Ordinates :63° 15' N. - 125° 18' W.
Geographic Location : 21 Miles SW of Long Lake (222° AZ.)

Geologists :C.D. Mc Cord, K.W. Campbell.
Date of measurement: June 14, 1963

FOSSIL SYMBOLS

F Fossiliferous
B Brachiopoda
G Gastropoda
Coral
Stromatopora
Foraminifera
Crinoid
Algae

POROSITY SYMBOLS

x intergranular, intercrystalline, interfragmental
v vuggular (greater than 1/16 mm)
f fractured
p pinpoint
• oil stained or petroliferous

LITHOLOGICAL SYMBOLS

Limestone
Dolomite
Dolomitic Limestone
Argillaceous Limestone
Argillaceous Dolomite
Silty Limestone
Limestone Breccia
Dolomite Breccia
Rugose to Rubbly
Coarse Crystallization
Shale
Calcareous Shale
Anhydritic Shale
Salt Casts
Pyritic
Micaceous
Siliceous
Siltstone
Ironstone
Sandstone
Chert, light or dark

AGE	FORMATION	SECTION THICKNESS	FORMATION THICKNESS	LITHOLOGICAL LOG	COLOUR	FOSSILS	POROSITY	SAMPLE NUMBER	DETAIL LITHOLOGICAL DESCRIPTION	LITHOLOGICAL SUMMARY	PALEONTOLOGICAL RECORD
MIDDLE ORDOVICIAN	(TRENTON - WILDERNESS) "RED SANDSTONES" (G.S.C.)	100 200 300 400				F B G Cr	POR FAIR GOOD VG	90 180 200 234 150 600 800 800 880	This section began in yellow orange weathering, platy, dolomite beds that were in contact with dolomitic limestones and dolomite beds stratigraphically above. The beds above weathered with a grey to buff color. This section was measured to compare the Ordovician section with that measured on the Whittaker Anticline. Dolomite - white and dark grey interbedded, siliceous, yellow tan weathering. Sandstone - light grey to white, weathering yellowish tan color, slightly lim, recistive, calcareous shale laminae within the sandstone have fossil-like rods. Fossiliferous siltstone. Limestone - black, crypto, argillaceous, weathers with a semi-lenticular argillaceous laminae; lates of coarse sin quartz and iron sulphides. Limestone - black, rubbly, platy, irregularly mottled purple color. Covered interval probably thin, platy, argillaceous, limestone, or limy shale as in the float; purple color reflects minute shale laminae. Contact with brilliant orange weathering zone, which is a sandstone, white, fine grained. No outcrop, fresh angular, blocky float, contains white, orange weathering, fine grained sandstone with occasional bed of fine siliceous shale. The upper 100 ft. contains more abundant purple weathering, medium to coarse gritty sandstone with thin rounded chert conglomerate beds. The purple color penetrates well into the rock; the rock has, in fact, a high content of purple shale. Limestone may be present in the section in minor amounts as a light grey, gritty-granular limestone was found in the screes. No outcrop, float is all purple-ground mass, conglomerate; fragments are mostly rounded ellipsoidal, white quartzite. Conglomerate outcrop, as the float described above.	60' Dolomite - white and dark grey interbeds, siliceous, yellow-tan weathering. 75' Sandstone, Shale and Siltstone Sandstone is lt grey, rd lime, recistive,weathers pale red color. Shale occurs as laminae in Sandstone and possibly as thicker beds in covered interval. Siltstone is fossiliferous. 120' Limestone - black, crypto, org., platy, weathers rubbly, mottled purple color from uneven laminae of very any limestone. Coarse sin qtz and iron sulphides present. 275' Conglomerate,sandstone and shale, interbedded in a brilliant orange weathering zone. Sandstone is lt grey to white as above, Shale is as above, occurs as thin beds and also as the matrix in the conglomerate which contains mostly rounded white quartzite pebbles.	Worm burrows Arthropod tracks.

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ROOT RIVER AREA
NORTHWEST TERRITORIES
STRATIGRAPHIC SECTION C.D.P. - 10
DAHADINNI RANGE

C.D.P-10

Prepared for Teck Corporation Limited
Canadian Devonian Petroleums Division

Co-Ordinates :63° 15' N. - 125° 18' W.
Geographic Location : 21 Miles SW of Long Lake (222° AZ.)

Geologists :C.D. Mc Cord, K.W. Campbell.
Date of measurement: June 14, 1963

FOSSIL SYMBOLS

F Fossiliferous
B Brachiopoda
G Gastropoda
Coral
Stromatopora
Foraminifera
Crinoid
Algae

POROSITY SYMBOLS

x intergranular, intercrystalline, interfragmental
v vuggular (greater than 1/16 mm)
f fractured
p pinpoint
• oil stained or petroliferous

LITHOLOGICAL SYMBOLS

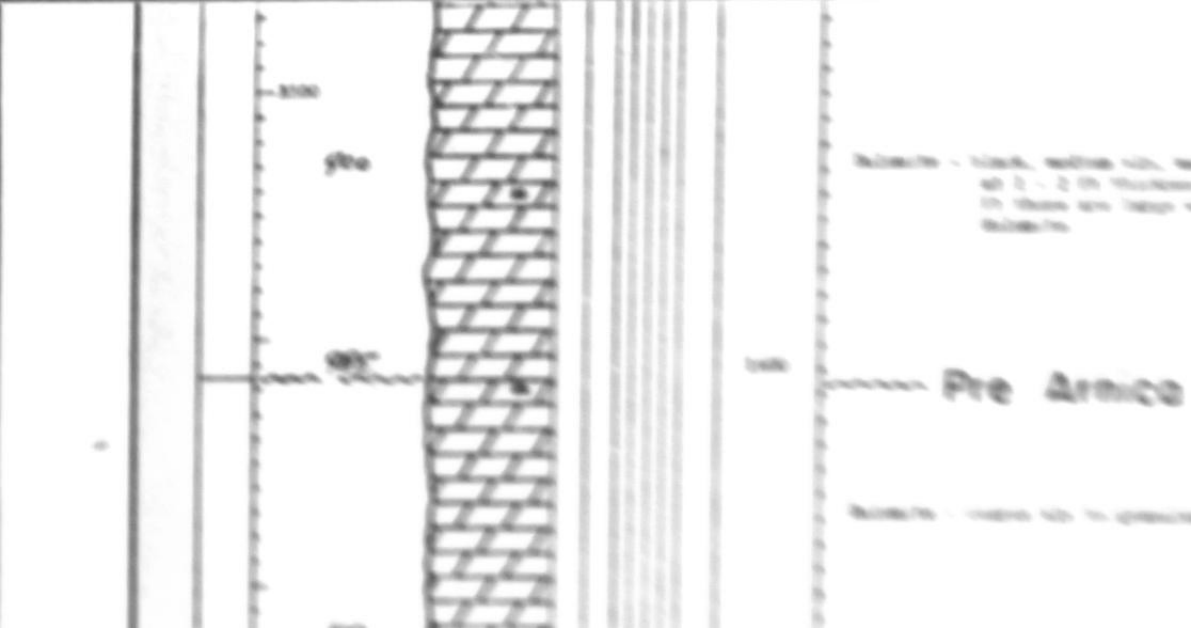
Limestone
Dolomite
Dolomitic Limestone
Argillaceous Limestone
Argillaceous Dolomite
Silty Limestone
Limestone Breccia
Dolomite Breccia
Rugose to Rubbly
Coarse Crystallization
Shale
Calcareous Shale
Anhydritic Shale
Salt Casts
Pyritic
Micaceous
Siliceous
Siltstone
Ironstone
Sandstone
Chert, light or dark

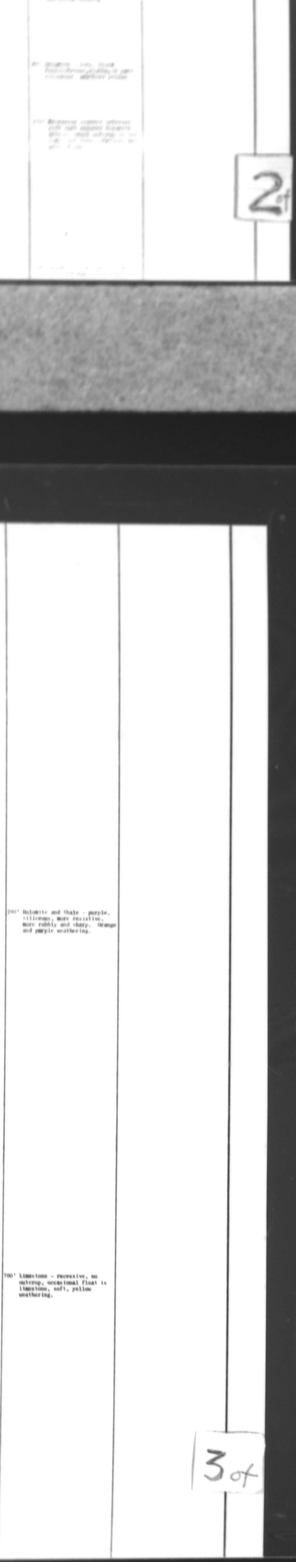
AGE	FORMATION	SECTION THICKNESS	FORMATION THICKNESS	LITHOLOGICAL LOG	COLOUR	FOSSILS	POROSITY	SAMPLE NUMBER	DETAIL LITHOLOGICAL DESCRIPTION	LITHOLOGICAL SUMMARY	PALEONTOLOGICAL RECORD
MIDDLE ORDOVICIAN	MIDDLE SUNBLOOD FM. (Ton weathering chert zone)	200 300 400				F B G Cr	POR FAIR GOOD VG	1404 1704	Limestone - extremely rubbly, abundant calcite veins and calcite debris, thin bedded, irregular bedding planes, purplish weathering shale laminae. Covered.		

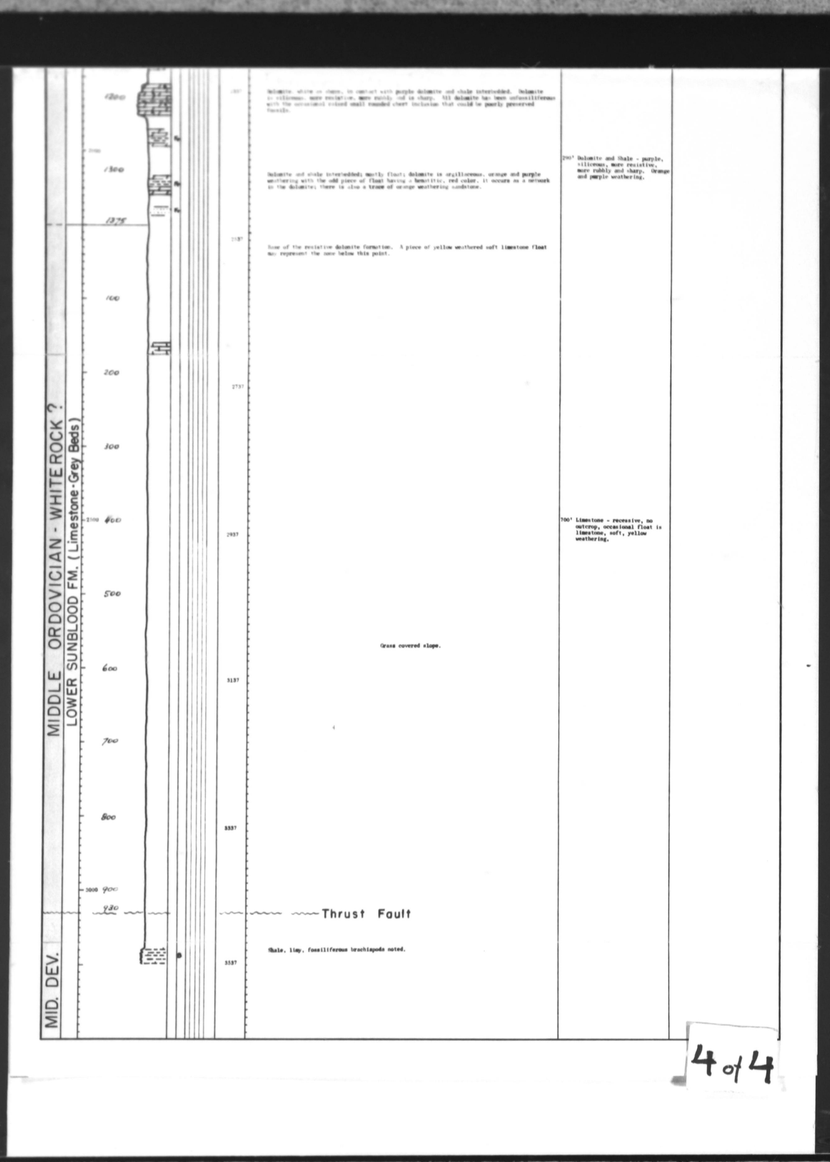
TY ▲ FILM

4 of

5 of 5


Pre Arnica





ROOT RIVER AREA
NORTHWEST TERRITORIES
STRATIGRAPHIC SECTION C.D.P. - 8
DAHADINNI RANGE

C.D.P.-8

Prepared for Teck Corporation Limited
Canadian Devonian Petroleums Division

Co-Ordinates : 63° 35' N - 125° 04' W.
Geographic Location : 9 Miles NW of Long Lake (315° AZ.)

Geologists : C.D. Mc Cord, K.W. Campbell.
Date of measurement : June 15, 1963

FOSSIL SYMBOLS

F Fossiliferous
B Brachiopoda
G Gastropoda
Coral
Stromatopora
Foraminifera
Crinoid
Algae

POROSITY SYMBOLS

x intergranular, intercrystalline, interfragmental
v vuggular (greater than 1/16 mm)
f fractured
p pinpoint
• oil stained or petroliferous

LITHOLOGICAL SYMBOLS

Limestone
Dolomite
Dolomitic Limestone
Argillaceous Limestone
Argillaceous Dolomite
Silty Limestone
Limestone Breccia
Dolomite Breccia
Rugose to Rubbly
Coarse Crystallization
Shale
Calcareous Shale
Anhydritic Shale
Salt Casts
Pyritic
Micaceous
Siliceous
Siltstone
Ironstone
Sandstone
Chert, light or dark

AGE	FORMATION	SECTION, FORMATIONS THICKNESS	LITHOLOGICAL LOG	COLOUR	FOSSILS	POROSITY	SAMPLE NUMBER	DETAIL LITHOLOGICAL DESCRIPTION	LITHOLOGICAL SUMMARY	PALEONTOLOGICAL RECORD
	NAHANNI FM.							Limestone - black, cryptic, siliceous, occasional calcite veins. Sharp smaller debris and bedding edges. Occasional interbeds of thin platy argillaceous black limestone - 2 - 3 inches thick. Estimated thickness of massive Nahanni Limestone - Base 2' thick beds occur 20' from the top of the massive limestone and contain fine-coarse crystals. Bedding is massive with irregular bedding planes. Cliff weathers a yellow tan color on the basal 75'.	2750' Limestone, black, cryptic, siliceous at top, argillaceous in lower 1/3 of section, massive, irregular bedding, fossiliferous. Base of thin platy argillaceous.	
							2750	Outcrop poor down a steep canyon shoulder.		
							2900	Limestone - black, v f grained to granular, argillaceous texture, light grey weathering, massive bedded, but quite fractured. Fossiliferous, recrystallized, recrystallized.		
							2940	Inaccessible outcrop.		
							3040	A view of the section from 2940' reveals that it is made up of alternately resistive and recessive units about 30' to 40' thick. The resistive units are located in the first recessive zone. All beds are quite argillaceous and commonly weathering and are stratigraphically positioned below a massive, light grey weathering, top layer. Station 2940' is located at the base of this resistive top layer.		
							3170	Poor outcrop, tributary creek at 2160' may be in a shale bed with resistive limestone bounding it at 2175'. Limestone weather orange - massive bedded,		

1 of 4

Limestone - [illegible]

[illegible]

Limestone - [illegible]

Limestone - interbedded as below. Medium bedded, generally one foot in thickness. Occasional two to three foot beds with a thick 5' bed at 1170' which causes a constriction in the canyon. A section downstream from this point is more resistive and more massive bedded. The section upstream is much more platy, argillaceous limestone that has only an occasional thick resistive bed in the section.

Limestone - interbedded siliceous and argillaceous beds. The siliceous beds are hard, dense, crpxln. The argillaceous beds are brownish blue grey, brown weathering and contain shale laminae.

Limestone - thin bedded, weathers with banded colors. Limestone is black, very finely xln to crpxln, siliceous, hard, interbedded with light tan mudstone and argillaceous medium grey limestones. Shale laminae becoming more prominent until limy shale bed encountered at 1170 feet. Outcrop has general tan grey weathered color.

Dolomite - crpxln, filled with calcite fossil detritous non-distinguishable, many stems. Free quartz crystal growth on fracture planes. At 950' a piece of white limy mudstone was described that contained white calcite phenochrysts.

Dolomite - black, crpxln, siliceous, hard, weathers tangrey, with angular sharp edges.

Approximate contact with drag folds below.

Dolomite - black, finely xln, light, outcrop has a yellowish weathering appearance and is relatively crumbly and massive bedded. There are drag folds in these sediments immediately below the contact of thinner more resistive angular weathered banded dolomites above.

Dolomite - coarse xln, vuggy in part.

[illegible]' Limestone, black, crpxln, [illegible]

[illegible]' Shale and Limestone - interbedded. Shale green grey, soft. Limestone, black, f gr, argillaceous semi-rubbly, massive bedded. Zone is brown and orange weathering.

575' Limestone - cyclically bedded; thin, bedded, v f xln to crpxln, siliceous, tight, hard interbedded with mudstone and limestone, brownish blue grey, arg grading to limey shale. Outcrop is tan grey weathering with serrated character due to variable resistance to weathering.

125' Dolomite - limy, cprxln, with calcite fossil detritus, thin bedded, semi-resistive.

125' Dolomite - black, f xln, tight, massive bedded crumbly, yellowish weathering.

2 of

MIDDLE

LANDRY FM.

200

1000

300

400

1170

500

575

950

Dolomite — cpxln, filled with calcite fossil detritous non-distinguishable, many stems, free quartz crystal growth on fracture planes. At 950' a piece of white limy mudstone was described that contained white calcite phenochrysts.

125' Dolomite - limy, cpxln, with calcite fossil detritus, thin bedded, semi-resistive.

Dolomite - black, cpxln, siliceous, hard, weathers tangrey, with angular sharp edges.

100

750

Approximate contact with drag folds below.

1300

Dolomite - black, finely xln, light, outcrop has a yellowish weathering appearance and is relatively crumbly and massive bedded. There are drag folds in these sediments immediately below the contact of thinner more resistive angular weathered banded dolomites above.

125' Dolomite - black, f xln, tight, massive bedded crumbly, yellowish weathering.

200

550

Dolomite - coarse xln, vuggy in part.

300

490

Dolomite - as below.

ARNICA FM.

400

350

Dolomite - as below. These rocks are thin bedded 1 to 1½' thick, as below, but they have been much fractured and contain some medium to coarse xln calcite and calcite veins. Beds in places are brecciated.

420' Dolomite, black, sucrose, soft, in part inter-granular porosity to vuggy porosity. Section contains considerable calcite and calcite veins filling fractures and breccia in a folded zone.

500

600

150

Dolomite - soft, sucrose, as below, in part porous (inter-granular), interbedded with dolomite black, finely xln, black, hard, tight.

2000

670

Dolomite - black, sucrose, good bedding becomes somewhat disturbed upward in section.

575' Limestone - cyclically bedded; thin, bedded, v f xln to crpxln, siliceous, tight, hard interbedded with mudstone and limestone, brownish blue grey, arg grading to limey shale. Outcrop is tan grey weathering with serrated character due to variable resistance to weathering.

1370

Limestone - interbedded siliceous and argillaceous beds. The siliceous beds are hard, dense, crpxln. The argillaceous beds are brownish blue grey, brown weathering and contain shale laminae.

Limestone - thin bedded, weathers with banded colors. Limestone is black, very finely xln to crpxln, siliceous, hard, interbedded with light tan mudstone and argillaceous medium grey limestones. Shale laminae becoming more prominent until limy shale bed encountered at 1150 feet. Outcrop has general tan grey weathered color.

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C.D.P.-9

ROOT RIVER AREA
NORTHWEST TERRITORIES
STRATIGRAPHIC SECTION C. D. P. - 9
DAHADINNI RANGE

Prepared for Teck Corporation Limited
Canadian Devonian Petroleums Division

Co-Ordinates : 63° 12' N - 124° 50' W
Geographic Location : 17 Miles due south of Long Lake

Geologists : C.D. Mc Cord, K.W. Campbell.
Date of measurement : June 15, 1963

FOSSIL SYMBOLS

F	Fossiliferous	ⅲ	Stromatopora
B	Brachiopoda	♈	Foraminifera
G	Gastropoda	⊙	Crinoid
⅋	Coral	⌓	Algae

POROSITY SYMBOLS

x	intergranular, intercrystalline, interfragmental
v	vuggular (greater than 1/16 mm)
f	fractured
p	pinpoint
•	oil stained or petroliferous

LITHOLOGICAL SYMBOLS

Limestone	Silty Limestone	Shale	Siliceous
Dolomite	Limestone Breccia	Calcareous Shale	Siltstone
Dolomitic Limestone	Dolomite Breccia	Anhydritic Shale	Ironstone
Argillaceous Limestone	Rugose to Rubbly	Salt Casts	Sandstone
Argillaceous Dolomite	Coarse Crystallization	Pyritic / Micaceous	Chert, light or dark

AGE	FORMATION	SECTION THICKNESS	FORMATION THICKNESS	LITHOLOGICAL LOG	COLOUR	FOSSILS	POROSITY (POOR / FAIR / GOOD / V.G.)	SAMPLE NUMBER	DETAIL LITHOLOGICAL DESCRIPTION	LITHOLOGICAL SUMMARY	PALEONTOLOGICAL RECORD
N	HEADLESS								This section was measured immediately North of Permit 34°2, the Permit wherein Mount Lyle is located. The section was measured in an attempt to describe the oldest exposed rocks on the Dahadinni Anticline.	100' Limestone, black, f xln, calcitic fossil fragments and calcite veins, Outcrop weathers dark grey.	
									Limestone - black, finely xln, fossil fragments, white calcite abundant, also calcite veins; rock weathers a dark grey.		
								160			
		100							Covered section with one outcrop in a central position; limestone, black, crpxln, unfossiliferous.		
								360			
									Limestone - becoming more argillaceous and grading to platy, limy shale in part.		
								41?			
		100							Scree slope.		
								61?			
						F			Limestone - black, siliceous, sonorous, somewhat friable and rubbly, weathers with an uneven bedding plane. Fossils collected at this point.		Murchisonia sp. Middle Devonian
		200									
									Scree slope as above with minor outcrop of limestone, black, finely xln, siliceous-sharp edged, in 1 ft. thick beds, unfossiliferous; occasional purplish to reddish weathering, very argillaceous, limestone laminae. Section weathers a tan colour.	620' Limestone - black, f xln, siliceous, sonorous, somewhat friable and rubbly, fossiliferous, minor brown shale partings cause uneven weathered bedding planes. These beds are cyclically interbedded with recessive, very argillaceous limestone and mudstones. The section weathers with a serrated profile typical of the Landry formation at other localities.	
		300						815			
	LANDRY FM.								Scree slope as above, in part, limy mudstone. This section is not unlike the interbedded resistive section described in Dahadinni Canyon on Section 8.		

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MIDDLE DEVONIAN

LANDRY FM.

ARNICA FM.

100
200
300
400
500
620
100
200
300
400
455

F
F
F
X
X
XV
B

61'

Limestone - black, siliceous, sonorous, somewhat friable and rubbly, weathers with an uneven bedding plane. Fossils collected at this point.

Marchisonia sp.
Middle Devonian

Scree slope as above with minor outcrop of limestone, black, finely xln, siliceous-sharp edged in 1 ft. thick beds, unfossiliferous; occasional purplish to reddish weathering, very argillaceous, limestone laminae. Section weathers a tan colour.

815'

620' Limestone - black, f xln, siliceous, sonorous, somewhat friable and rubbly, fossiliferous, minor brown shale partings cause uneven weathered bedding planes. These beds are cyclically interbedded with recessive, very argillaceous limestone and mudstones. The section weathers with a serrated profile typical of the Landry formation at other localities.

Scree slope as above, in part, limy mudstone. This section is not unlike the interbedded resistive section described in Bahadinni Canyon on Section 8.

1015'

Grass covered slope, top of outcrop cliff at 1125'.

1125'

Limestone - black, variably xln. Mostly crpxln. Minor brownish shale partings, in part uneven bedding planes. Limestone grades to brownish mudstone in some beds. Both the limestone and the mudstone are siliceous and sharp edged; massive bedded with some rare, calcitic, poorly preserved fossils.

1275'

Section is scree covered and the scree in part includes black chert bands.

1325'

Scree slope with outcrop at the 1425 mark. Scree has limestone, black, with white calcite worms -streaks suggestive of fossils. Probably come from cliff above but was not seen in outcrop. Scree has a very sonorous character; probably siliceous.

1425'

Limestone - dark grey, crpxln. with calcite fractures and shale laminations.

455' Dolomite - limy or dolomitic limestone - black, blue grey, crpxln, siliceous, sonorous. Section is massive bedded, laced with calcite veins, poorly fossiliferous. Laminated, brown weathering, porous to vuggy beds common, with some brecciation noted. Calcite veins weather orange color in part.

1525'

Limestone - blue grey, brownish crpxln laced with white calcite veins. The last 400 ft. from 1325 to 1725 could possibly be limy dolomite. Float at 1725 had cream, vuggy, dolomite debris. Debris from breccia beds is also present.

1725'

Limestone - black, crpxln, with abundant orange weathering thin calcite veins; limestone is slightly fossiliferous including brachiopods shells, sparse. There again is a trace of dolomite, black, fine xln, brown weathering, laminated; that contain intercrystalline porosity and pin point vugs. White calcite crystals in the vugs.

1850'

1925'

Grass and scree slope. 2225 is the base of the outcrop slope and the end of the section. Imperial formation shale is underlying the grass and tree covered flat area at the bottom of this outcrop; thus a thrust fault is interpreted at this point.

2225'

2 of 2

C.D.P.-10

ROOT RIVER AREA
NORTHWEST TERRITORIES
STRATIGRAPHIC SECTION C. D. P. - 10
DAHADINNI RANGE

Prepared for Teck Corporation Limited
Canadian Devonian Petroleums Division

Co-Ordinates : 63° 12' N. - 124° 50' W.
Geographic Location: 2 Miles due North of Mount Lylel

Geologists :C.D. Mc Cord, K.W. Campbell.
Date of measuremeni: June 15, 1963

FOSSIL SYMBOLS

F Fossiliferous
B Brachiopoda
G Gastropoda
Coral
Stromatopora
Foraminifera
Crinoid
Algae

POROSITY SYMBOLS

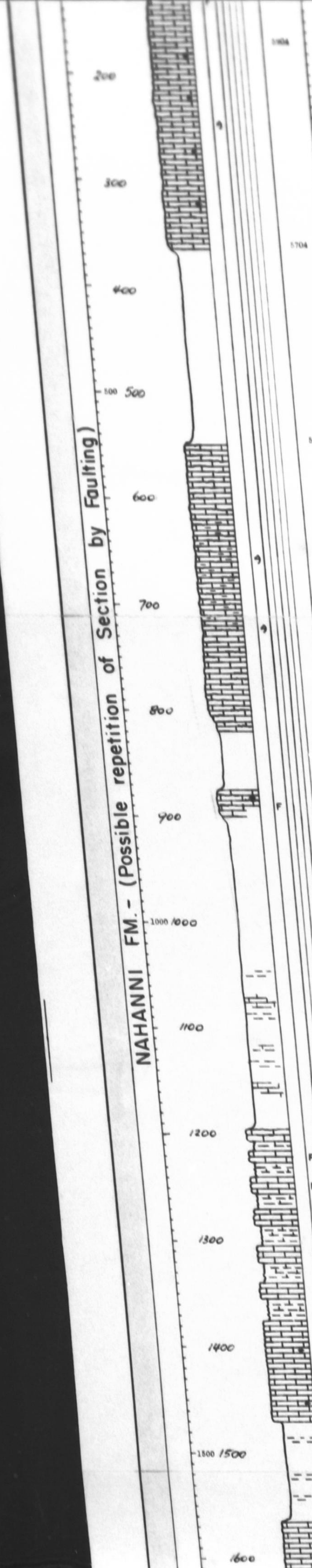
x intergranular, intercrystalline, interfragmental
v vuggular (greater than 1/16 mm)
f fractured
p pinpoint
• oil stained or petroliferous

LITHOLOGICAL SYMBOLS

Limestone
Silty Limestone
Shale
Siliceous
Dolomite
Limestone Breccia
Calcareous Shale
Siltstone
Dolomitic Limestone
Dolomite Breccia
Anhydritic Shale
Ironstone
Argillaceous Limestone
Rugose to Rubbly
Salt Casts
Sandstone
Argillaceous Dolomite
Coarse Crystallization
Pyritic
Micaceous
Chert, light or dark

AGE	FORMATION	SECTION THICKNESS	FORMATION THICKNESS	LITHOLOGICAL LOG	COLOUR	FOSSILS	POROSITY (POOR / FAIR / GOOD / VG)	SAMPLE NUMBER	DETAIL LITHOLOGICAL DESCRIPTION	LITHOLOGICAL SUMMARY	PALEONTOLOGICAL RECORD
		100				F		6104	End of outcrop - Base of Mountain Range (probably base of Upper Devonian Imperial formation)		
						F			Limestone - rubbly; tubular calcareous fossils create nodular scree. Limestone weathers light grey.		
		200						1904			
									Limestone - extremely rubbly, abundant calcite veins and calcite debris, thin bedded, irregular bedding planes, purplish weathering shale laminae.		
		300						1704			
		400							Covered.		
		500									

1 of



5804 — Limestone - extremely rubbly, abundant calcite veins and calcite debris, thin bedded, irregular bedding planes, purplish weathering shale laminae.

5704

Covered.

5564 — Limestone - rubbly, beds 4 - 8" irregularly laminated. Material is rubbly weathering due to the high content of fossil shells and calcite.

5504 — Limestone - finely xln, arg, rubbly bedded, fossiliferous. Large, single, horn corals and smaller, branching corals present.

5400

Coral collected at 5400.

5304

Covered

5239 — Limestone - brown grey, crpxln, rubbly weathering, slightly fossiliferous, with calcite veins.

Covered.

5104 — Shale - medium grey, soft, semi-slaty, limy , weathers brown, with occasional bed of limestone, fine xln, blue grey, brown weathering, rubbly. Section is covered with debris from limestone above, (stratigraphically positioned below).

4904 — Limestone - arg, slabby, irregular surfaced bedding plane exposed on dip slope; may introduce a thick shale section.

Shale - slaty, limy , interbedded with limestone, blue grey, fine grained to granular, slightly fossiliferous.

4704

Limestone - blue grey, crpxln, with white calcite fragments in part.

4604

Shale saddle.

4504

Limestone - lt grey, crpxln to lithographic, fossiliferous, Nahanni type.

1500 - Limestone - lt, blue grey crpxln, arg., semi-slaty to irregular slabby - rubbly weathering. Includes calcite filled fractures, abundant fossil debris and shale lamina. One third of section is comprised of covered intervals which may represent shale or very argillaceous limestone zones.

Shale outcrop observed is med blue grey, soft, semi slaty, limy fine grained to granular, slightly fossiliferous.

This Nahanni limestone section is located on the rear vertical east limb of the Dahadinni Anticline. The abnormal thickness of the formation has possibly resulted from repetition by faulting.

Thamnopoira limitaris (Middle Devonian)

2

LAND

ARNICA FM.

Fe

B

	3506	
		Limestone - as above and below.
	3406	
		Limestone - very argillaceous; or shale, limy ; 6" to 1' thick beds that shatter with acicular structure at right angles to bedding planes. Weathers light grey to white.
	3206	
		Limestone - black, crpxln, thin bedded, smooth bedding planes, trace of brachipods, trace of isometric iron sulphite crystals.
	3106	Dolomite - uppermost bed.
		Dolomite - as below, repeated small outcrops, section mostly grass covered.
	2970	
		Dolomite - black, outcrop every 40 ft., remainder of section grass covered.
	2770	
		Dolomite - as below, black, medium crystalline, no fossils.
	2570	
		Dolomite - brownish blue, interbedded; platy beds with massive resistive beds.
	2370	
		Dolomite - bluish grey, slight brown tinge on fractures surfaces, medium xln, argillaceous, platy, interbedded with crpxln dolomite, blue-grey to black weathering.
	2170	Dolomite - medium grained, medium xln, with trace of vuggy to intercrystalline porosity, weathers white.
	2140	Dolomite - as before, platy.
		Dolomite - interbedded as below.
	2070	
		Dolomite - as above and below.
	2000	
		Dolomite - dark and light grey interbedded; medium xln rubbly weathering. Bedding more distinct then below,(1 - 2 ft beds.)
	1920	
		Dolomite - as below.
	1800	
		Dolomite - black, medium xln, massive bedded. Bedding distinct only occasionally at 1 - 2 ft thicknesses. Dark grey weathering, rubbly scree. At 1,600 ft there are large white calcite blebs and small calcite veins in dolomite.
	1600	Pre Arnica erosion ?
		Dolomite - coarse xln to granular, white weathering, massive.
	1400	

grey, very argillaceous, grading to limy shale, with acicular fractures, weathers lt grey to white.

590' - Dolomite - black, med xln, unfossiliferous; thick bedded; interbedded with dolomite, bluish grey, brown on fresh fractured surfaces, med xln, argillaceous,platy.

995' - Dolomite - color banded, dark and light grey, unweathered color - black, med xln, bedding mostly indistinct 1 - 2 ft. thick. Weathers rubbly. Calcite blebs and veins cause rubbly nature of scree.

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C.D.P. - 11 & 12

ROOT RIVER AREA
NORTHWEST TERRITORIES
STRATIGRAPHIC SECTION C. D. P. - 11 & 12
WHITTAKER RANGE

Prepared for Teck Corporation Limited
Canadian Devonian Petroleums Division

Co-Ordinates : 62° 36' N. - 124° 49' W.
Geographic Location : 8 Miles NW of Trench Lake (340° AZ.)
Geologists : C.D. Mc Cord, K.W. Campbell
Date of measurement : June 16, 1963

FOSSIL SYMBOLS

F Fossiliferous
B Brachiopoda
G Gastropoda
Coral
Stromatopora
Foraminifera
Crinoid
Algae

POROSITY SYMBOLS

x intergranular, intercrystalline, interfragmental
v vuggular (greater than 1/16 mm)
f fractured
p pinpoint
• oil stained or petroliferous

LITHOLOGICAL SYMBOLS

Limestone
Dolomite
Dolomitic Limestone
Argillaceous Limestone
Argillaceous Dolomite
Silty Limestone
Limestone Breccia
Dolomite Breccia
Rugose to Rubbly
Coarse Crystallization
Shale
Calcareous Shale
Anhydritic Shale
Salt Casts
Pyritic
Micaceous
Siliceous
Siltstone
Ironstone
Sandstone
Chert, light or dark

AGE	FORMATION	SECTION THICKNESS	FORMATION THICKNESS	LITHOLOGICAL LOG	COLOUR	FOSSILS	POROSITY (POOR / FAIR / GOOD / VG)	SAMPLE NUMBER	DETAIL LITHOLOGICAL DESCRIPTION	LITHOLOGICAL SUMMARY	PALEONTOLOGICAL RECORD
UP. DEVONIAN	FT. SIMPSON FM.								Shale - black with siltstone, outcrop weathers dk grey; one massive basal bed weathers orange, also laminae throughout shale. Shale and siltstone not lamy. Section dips SE but is badly contorted.		
										200' Simpson shale - mostly covered, very recessive along front of vertical resistive beds of Nahanni formation in Whittaker range. Black shale with siltstone.	
									Covered interval presumably Simpson formation shales as above.		
	NAHANNI FM.							145s	Limestone - blue grey to black, f xln to crypto, fine calcite material throughout, bedding as evidenced by hairline fractures to a massive resistive cliff is all less than one foot thick with average approximately seven inches. Bedding in upper 70 feet averages 2 - 3 inches in thickness but is still very resistive; weathers med grey with some orange staining of calcite.	250' Limestone - blue-grey, f to crypto, bedding less than 1 foot thick, but section is very resistive, fine orange weathering calcite material, carbonaceous.	
								120s	Limestone - med grey, cry to f xln, fewer shale laminae than below, not as rubbly, variable resistance to erosion - probably results from a variable org content.		

1 of

ROOT RIVER AREA
NORTHWEST TERRITORIES
STRATIGRAPHIC SECTION C.D.P.-11 & 12
WHITTAKER RANGE

C.D.P.-11 & 12

Prepared for Teck Corporation Limited
Canadian Devonian Petroleums Division

Co-Ordinates :62° 36' N. - 124° 49' W.
Geographic Location: 8 Miles NW of Trench Lake (340°AZ)

Geologists : C.D. Mc Cord, K.W. Campbell
Date of measurement: June 16, 1963

FOSSIL SYMBOLS

- F Fossiliferous
- B Brachiopoda
- G Gastropoda
- Coral
- Stromatopora
- Foraminifera
- Crinoid
- Algae

POROSITY SYMBOLS

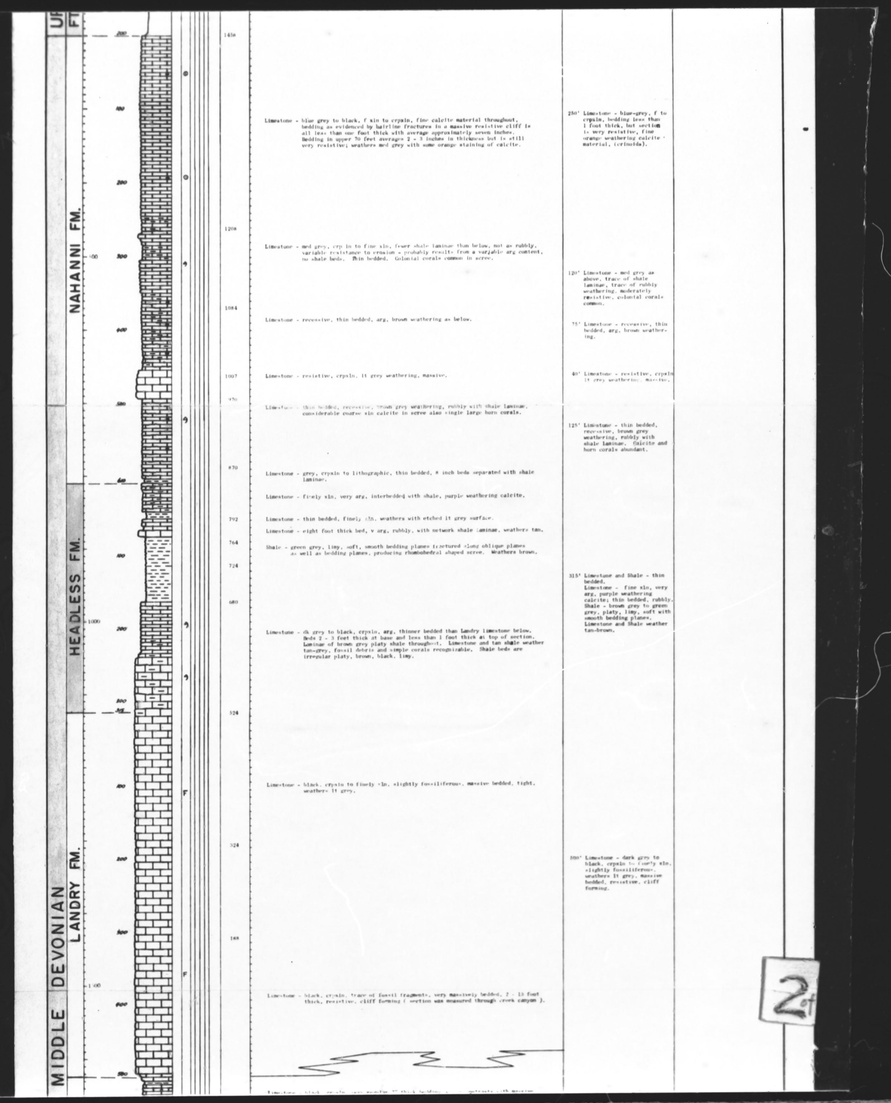
- x intergranular, intercrystalline, interfragmental
- v vuggular (greater than 1/16 mm)
- f fractured
- p pinpoint
- • oil stained or petroliferous

LITHOLOGICAL SYMBOLS

- Limestone
- Dolomite
- Dolomitic Limestone
- Argillaceous Limestone
- Argillaceous Dolomite
- Silty Limestone
- Limestone Breccia
- Dolomite Breccia
- Rugose to Rubbly
- Coarse Crystallization
- Shale
- Calcareous Shale
- Anhydritic Shale
- Salt Casts
- Pyritic / Micaceous
- Siliceous
- Siltstone
- Ironstone
- Sandstone
- Chert, light or dark

AGE	FORMATION	SECTION THICKNESS	CUMULATIVE THICKNESS	LITHOLOGICAL LOG	COLOUR	POROSITY: POOR	FAIR	GOOD	SAMPLE NUMBER	DETAIL LITHOLOGICAL DESCRIPTION	LITHOLOGICAL SUMMARY	PALEONTOLOGICAL RECORD
UP. DEVONIAN	FT. SIMPSON FM.									Shale - black with siltstone, outcrop weathers dk grey; one massive basal bed weathers orange; plan laminae throughout shale. Shale and siltstone not limy. Section tops NE but is badly contorted.	200' Simpson shale - mostly covered, only recessive piney front of vertical resistive beds of Nahanni formation in Whittaker range. Black shale with siltstone.	
		400								Covered interval presumably Simpson formation shales as above.		
		300							1434			
										Limestone - blue grey to black, f xln to crypto, fine calcite material throughout, bedding as evidenced by hairline fractures in a massive resistive cliff is all less than one foot thick with average approximately seven inches. Bedding in upper 70 feet averages 2 - 3 inches in thickness but is still very resistive; weathers med grey with some orange staining of calcite.	250' Limestone - blue-grey, f to crypto, bedding less than 1 foot thick, but section is very resistive, fine orange weathering calcite material, (orthocids).	
		200										
			1200							Limestone - med grey, crp to f xln slv, fewer shale laminae than below, not as rubbly, variable resistance to erosion - probably results from a variable arg content, no shale beds. Thin bedded. Colonial corals common in areas.		
		100										

1 of



Limestone - blue grey to black, f xln to crypto, fine calcite material throughout, bedding as evidenced by hairline fractures in a massive resistive cliff is all less than one foot thick with average approximately seven inches. Bedding in upper 70 feet averages 2 - 3 inches in thickness but is still very resistive; weathers med grey with some orange staining of calcite.

Limestone - med grey, crp to f xln slv, fewer shale laminae than below, not as rubbly, variable resistance to erosion - probably results from a variable arg content, no shale beds. Thin bedded. Colonial corals common in areas.

Limestone - recessive, thin bedded, arg, brown weathering as below.

Limestone - resistive, crypto. lt grey weathering, massive.

Limestone - thin bedded, recessive, brown grey weathering, rubbly with shale laminae, considerable coarse xln calcite in screw alae - single large horn corals.

Limestone - grey, crypto to lithographic, thin bedded, 4 inch beds separated with shale laminae.

Limestone - finely xln, very arg, interbedded with shale, purple weathering calcite.

Limestone - thin bedded, finely xln, weathers with etched lt grey surface.

Limestone - eight foot thick bed, v arg, rubbly, with network shale laminae, weathers tan.

Shale - green grey, limy, soft, smooth bedding planes fractured along oblique planes as well as bedding planes, producing rhomboidal shaped screw. Weathers brown.

Limestone - dk grey to black, crypto, arg, thinner bedded than Landry Limestone below. Beds 2 - 3 feet thick at base and less than 1 foot thick at top of section. Laminae of brown grey platy shale throughout. Limestone and tan shale weather tan-grey, fossil debris and simple corals recognizable. Shale beds are irregular platy, brown, black, limy.

Limestone - black, crypto to finely xln, slightly fossiliferous, massive bedded, tight, weathers lt grey.

Limestone - black, crypto, frame of fossil fragments, very massively bedded, 2 - 10 foot thick, recessive, cliff forming (section was measured through creek canyon).

250' Limestone - blue-grey, f to crypto, bedding less than 1 foot thick, but section is very resistive, fine orange weathering calcite material, (orthocids).

120' Limestone - med grey as above, trace of shale laminae, trace of rubbly weathering, moderately resistive, colonial corals common.

75' Limestone - recessive, thin bedded, arg, brown weathering.

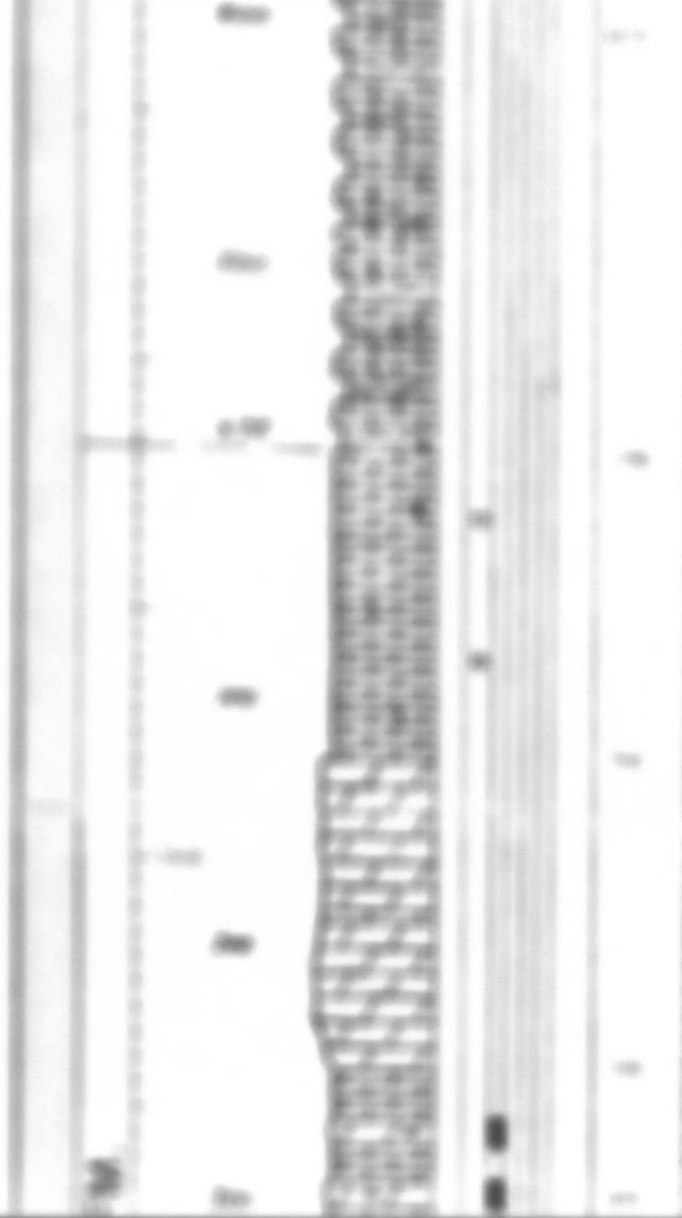
40' Limestone - resistive, crypto lt grey weathering, massive.

125' Limestone - thin bedded, recessive, brown grey weathering, rubbly with shale laminae. Calcite and horn corals abundant.

115' Limestone and Shale - thin bedded. Limestone - fine xln, very arg, purple weathering calcite. Shale - soft, rubbly, green to brown grey, platy, limy, soft with smooth bedding planes. Limestone and Shale weather tan-brown.

200' Limestone - dark grey to black, crypto to finely xln, slightly fossiliferous, weathers lt grey, massive bedded, recessive, cliff forming.

2 of



Limestone - light gray, cyclic, with calcite fossil detritus, thin bedded, semi-resistive.

Limestone - black, 1 ft. light, massive bedded crumbly, yellow ish weathering.

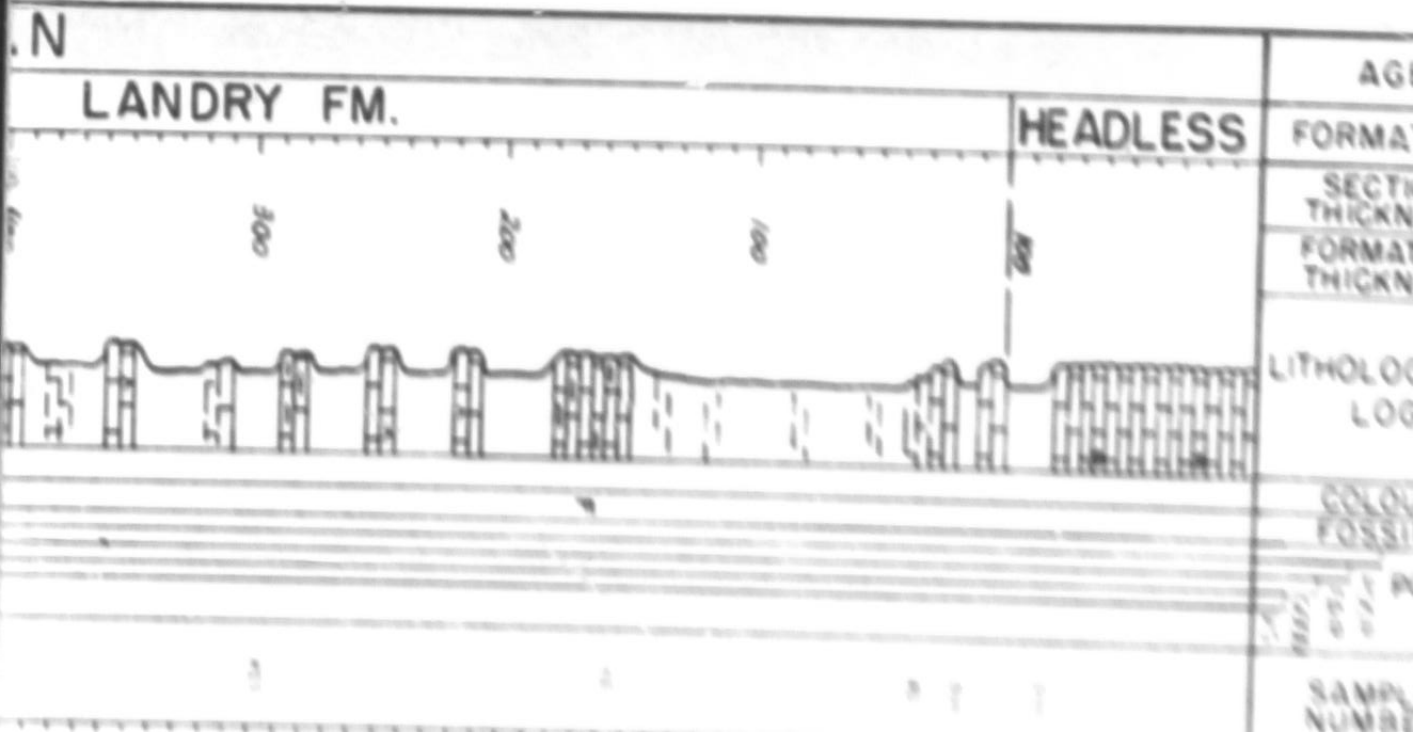
600

150

Dolomite - soft, sucrose, as below, in part porous (inter-granular), interbedded with dolomite black, finely xln, black, hard, tight.

2000 650

Dolomite - black, sucrose, good bedding becomes somewhat disturbed upward in section.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WH

Prepared fo
Canadian

Co-Ordinates : 62° 34' N. - 124° 47' 36" W.
Geographic Location : 5 Miles NW of Trench Lake

FOSSIL SYMBOLS

F	Fossiliferous	≡	Stromatopora
B	Brachiopoda	▽	Foraminifera
G	Gastropoda	○	Crinoid
⊹	Coral	⌒	Algae

LITHO

	Limestone		Silty Limes
	Dolomite		Limestone
	Dolomitic Limestone		Dolomite Be
	Argillaceous Limestone		Rugose to R
	Argillaceous Dolomite		Coarse Cryst

AGE | FORMATION | SECTION THICKNESS | FORMATION THICKNESS | LITHOLOGICAL LOG | COLOUR | FOSSILS | PORO ITY | SAMPLE NUMBER | DETAIL L

C.D.P.-13

ROOT RIVER AREA
NORTHWEST TERRITORIES
STRATIGRAPHIC SECTION C. D. P. - 13
WHITTAKER RANGE

Prepared for Teck Corporation Limited
Canadian Devonian Petroleums Division

Co-Ordinates : 62° 34' N. - 124° 47' 36" W.
Geographic Location : 5 Miles NW of Trench Lake (345° AZ.)
Geologists : C.D. Mc Cord, K.W. Campbell
Date of measurement : June 17, 1963

FOSSIL SYMBOLS

F Fossiliferous
B Brachiopoda
G Gastropoda
Coral
Stromatopora
Foraminifera
Crinoid
Algae

POROSITY SYMBOLS

x intergranular, intercrystalline, interfragmental
v vuggular (greater than 1/16 mm)
f fractured
p pinpoint
• oil stained or petroliferous

LITHOLOGICAL SYMBOLS

Limestone
Dolomite
Dolomitic Limestone
Argillaceous Limestone
Argillaceous Dolomite
Silty Limestone
Limestone Breccia
Dolomite Breccia
Rugose to Rubbly
Coarse Crystallization
Shale
Calcareous Shale
Anhydritic Shale
Salt Casts
Pyritic
Micaceous
Siliceous
Siltstone
Ironstone
Sandstone
Chert, light or dark

AGE	FORMATION	SECTION THICKNESS	FORMATION THICKNESS	LITHOLOGICAL LOG	COLOUR	FOSSILS	POROSITY (POOR / FAIR / GOOD / V.G.)	SAMPLE NUMBER	DETAIL LITHOLOGICAL DESCRIPTION	LITHOLOGICAL SUMMARY	PALEONTOLOGICAL RECORD
								2237	Contact - limestone breccia of Camsell formation and blue grey very fine crystalline dolomite of overlying Sombre formation.		
							x				
				100			x				
				200				1997			
							v		Limestone Breccia - light green with minor yellow and orange mottling. Very brecciated and very rust colored on fresh surface, angular, very fine grain, crpxl tan grey fragments in calcite matrix. Weathers in semi-resistant, rounded, relatively smooth shoulder on ridge.	550' Limestone - breccia, calcite matrix, coarse crystalline; orange-yellow weathering. Argillaceous, very fine crystalline, tan-grey fragments. Outcrop weathers semi-resistive, rounded; scree rubbly, light grey.	
				300			x				
								1797			
				400			v				
							x				
500				500			v				

1 of

MIDDLE DEVONIAN
CAMSELL FM.

	200	1997	
	300		Limestone Breccia - light green with minor yellow and orange mottling. Very brecciated and very rust colored on fresh surface, angular, very fine grain, crysl tan grey fragments in calcite matrix. Weathers in semi-resistant, rounded, relatively smooth shoulder on ridge.
	400	1797	
500	500	1517	Limestone - tan, very fine crystalline - massive bedded with a few 1 foot yellow-rust weathered zones near the top of the section. These breccia zones have boxwork cavities from weathering out of laminated limestone fragments (Salt casts ?).
	600	1437	
	700	1237	Limestone - tan very fine crystalline, crysl, very massive bedded 4--10' thick.
	800	1200	Limestone - blue grey crystalline, interbedded 50-50 with argillaceous breccia zones as below.
	900	1049	Limestone - interbedded with yellow weathering shale, 80% of section is softer yellow weathering, rubbly, irregular slabby material comprised of white, medium to coarse crystalline calcite and limestone, containing yellow-rust network of argillaceous laminae.
1,000	1000	849	
	1100	823	Limestone - massive, blue grey, very fine crystalline.
		779	Limestone - interbedded massive limestone as below, and yellow weathering shale, also limestone white, medium crystalline, irregular slabby, with coarsely crystalline calcite veins.
	1200		Limestone - beds range in color from tan to brown to medium grey and crysl to fine crystalline. Resistive beds approximately 35% of section.
	1300	579	Limestone - light tan, fine crystalline, with dark blue grey crysl limestone interbedded. Brecciation in part, in yellow weathering patches that are oblique to bedding. Zone is resistive and forms the "back bone" of the Camsell formation ridge outcrop.
	1400	459	Shale - irregular platy, interbed with occasional limestone bed, crysl, dark grey, brecciated.
1,500	1500	373	
		309	
	1600		Limestone Breccia - brecciation not as extremely developed as below. Bedding quite distinct. occasional bed weathers light grey appears unbrecciated, but contains network of

550' Limestone - breccia, calcite matrix, coarse crystalline; orange-yellow weathering. Argillaceous, very fine crystalline, tan-grey fragments. Outcrop weathers semi-resistive, rounded; scree rubbly, light grey.

210' Limestone - tan, very fine crystalline, massive bedded, very resistive, 4--10' foot thick beds.

540' Limestone - and shale interbedded, limestone blue grey very fine crystaline and white, medium crystaline, is resistive and massive bedded in sections not containing shale laminae, is recessive and rubbly in argillaceous zones.

Shale - soft yellow weathering calcite veins common, but brecciation not as developed as the top of formation.

120' Limestone - light tan, grey, fine crystalline, resistive, yellow brecciated patches in part.

450' Limestone - breccia in

2 of

MIDDLE DEVONIAN

CAMSELL FM.

1,000 /100 /200 /300 /400 /500 /600 /700 /800 /860

1250

1200 Limestone - blue grey crystalline, interbedded 70-30 with argillaceous breccia zones as below.

1040

Limestone - interbedded with yellow weathering shale, 80% of section is softer yellow weathering rubbly, irregular slabby material comprised of white, medium to coarse crystalline calcite and limestone, containing yellow-rust network of argillaceous laminae.

540' Limestone - and shale interbedded, limestone blue grey very fine crystalline and white, medium crystalline, is resistive and massive bedded in sections not containing shale laminae; is recessive and rubbly in argillaceous zones.

Shale - soft yellow weathering calcite veins common, but brecciation not as developed as the top of formation.

540

523

Limestone - Massive, blue grey, very fine crystalline.

770

Limestone - interbedded massive limestone as below, and yellow weathering shale, also limestone white, medium crystalline, irregular slabby, with coarsely crystalline calcite veins.

Limestone - beds range in color from tan to brown to medium grey and crpxl to fine crystalline. Resistive beds approximately 35% of section.

579

Limestone - light tan, fine crystalline, with dark blue grey crpxl limestone interbedded; brecciation in part, in yellow weathering patches that are oblique to bedding. Zone is resistive and forms the "back bone" of the Camsell formation ridge outcrop.

120' Limestone - light tan, grey, fine crystalline, resistive, yellow brecciated patches in part.

659

Shale - irregular platy, interbed with occasional limestone bed, crpxl, dark grey, brecciated.

773

900

Limestone Breccia - brecciation not as extremely developed as below. Bedding quite distinct, occasional bed weathers light grey appears unbrecciated, but contains network of calcite veins - limestone light tan grey, finely crystalline.

450' Limestone - breccia in massive bedded grey-buff argillaceous, granular, crpxl limestone.

Shale beds in part, particularly at base of section, irregular platy lime, orange weathering.

200

120

Limestone Breccia - massive 4 - foot thick beds, with two 12 foot recessive units probably contain argillaceous horizons or shales.

54

Limestone Breccia - orange weathering calcite matrix with angular grey-buff, granular to crpxl inclusions up to 1 inch in size, argillaceous laminae in fragments. Zone is semi-recessive.

Shale - 5' bed, orange weathering, platy, with white crystalline limestone laminae.

Limestone Breccia - as above.

Contact - light grey, fine crystalline, siliceous, slabby dolomite.

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C.D.P.-15

ROOT RIVER AREA
NORTHWEST TERRITORIES
STRATIGRAPHIC SECTION C. D. P. - 15
WHITTAKER RANGE

Prepared for Teck Corporation Limited
Canadian Devonian Petroleums Division

Co-Ordinates : 62° 01' N. - 124° 52' W.
Geographic Location : 5 Miles NW of Trench Lake (205° AZ.)

Geologists : C.D. Mc Cord, K.W. Campbell.
Date of measurement : June 17, 1963

FOSSIL SYMBOLS

F Fossiliferous
B Brachiopoda
G Gastropoda
Coral
Stromatopora
Foraminifera
Crinoid
Algae

POROSITY SYMBOLS

x intergranular, intercrystalline, interfragmental
v vuggular (greater than 1/16 mm)
f fractured
p pinpoint
• oil stained or petroliferous

LITHOLOGICAL SYMBOLS

Limestone
Dolomite
Dolomitic Limestone
Argillaceous Limestone
Argillaceous Dolomite
Silty Limestone
Limestone Breccia
Dolomite Breccia
Rugose to Rubbly
Coarse Crystallization
Shale
Calcareous Shale
Anhydritic Shale
Salt Casts
Pyritic
Micaceous
Siliceous
Siltstone
Ironstone
Sandstone
Chert, light or dark

EQUIVALENT TO "RED SANDSTONES" CDP-7

AGE	FORMATION	SECTION THICKNESS	FORMATION THICKNESS	LITHOLOGICAL LOG	COLOUR	FOSSILS	POROSITY (POOR / FAIR / GOOD / VG)	SAMPLE NUMBER	DETAIL LITHOLOGICAL DESCRIPTION	LITHOLOGICAL SUMMARY	PALEONTOLOGICAL RECORD
		100				F		6 - 666	Limestone - white, fossil fragmental, weather mottled, medium grey, with orange patches.		
		200							Limestone - dark grey, rust weathering, with shale laminae.		
									Covered slope - talus as above, light tan weathering.		
								6 - 466	Shale - black, brown weathering, limy, slaty.		
		300							Limestone - black, fragmental, fossiliferous, grading to shale upward.	435' Limestone - dark grey to black, crpxln to med xln, fossiliferous in part, fragmental in part, platy, argillaceous with shale laminae. Lim slaty shale beds exposed may represent several other shale zones in covered intervals that comprise 50% of section. Shale lamina weather purple or rust colours from oxidation of sulphide minerals present.	Maclurites sp. U. Ordovician.
								6 - 400			
		400							Limestone - medium grey, medium crystalline, resistive, sonorous, siliceous with mottled, rust and purple weathering shale laminae, weathers rubbly, fossil poorly preserved.		
									Covered slope, scree as above, limestone, coarse crystalline.		
								6 - 200	Limestone - dark grey, crpxl, argillaceous, platy, dark grey weathering, with some orange coloration.		
									Covered saddle, slope contains medium grey, coarse crystalline limestone.		
									Limestone - black, crpxl, argillaceous, irregular platy, with granular shale laminations.		
									Limestone - light greenish blue grey, soapy lustre.		
								15 - 100			
								15 - 200	Limestone - or limy dolomite, very finely xln, tight, irregularly platy, weathers orange.		

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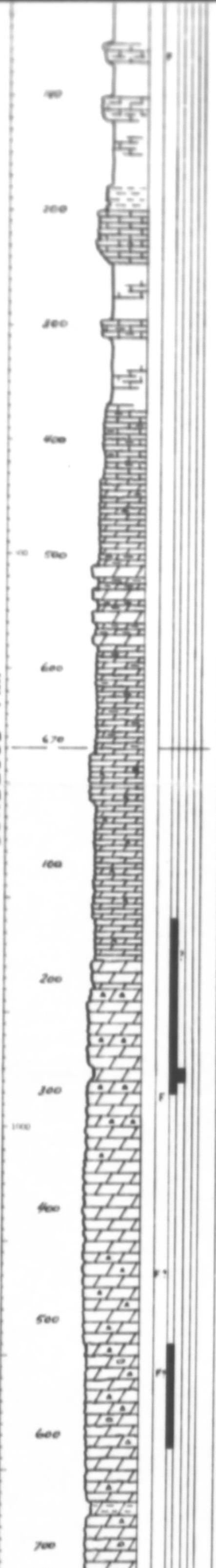
EQUIVALENT TO "RED SANDSTONES" CDP-7

MIDDLE ORDOVICIAN

SUNBLOOD FM.



0 - 100	Limestone - white, fossil fragmental, weathers mottled, medium grey, with orange patches.		
	Limestone - dark grey, rust weathering, with shale laminae.		
	Covered slope - talus as above, light tan weathering.		
100 - 200	Shale - black, brown weathering, lam., slaty.		
	Limestone - black, fragmental, fossiliferous, grading to shale upward.	435' Limestone - dark grey to black, crpxln to med xln, fossiliferous in part, fragmental in part, platy, argillaceous with shale laminae. Lm: slaty shale beds exposed may represent several other shale zones in covered intervals that comprise 80% of section. Shale lamina weather purple or rust colors from oxidation of sulphide minerals present.	Macluritus sp. U. Ordovician.
200 - 300	Limestone - medium grey, medium crystalline, resistive, vuggy, siliceous with mottled, rust and purple weathering shale laminae, weathers rubbly, fossil poorly preserved		
	Covered slope, same as above, limestone, coarse crystalline.		
300 - 400	Limestone - dark grey, crypt, argillaceous, platy, dark grey weathering, with some orange coloration.		
	Covered saddle, slope contains medium grey, coarse crystalline limestone.		
	Limestone - black, crypt, argillaceous, irregular platy, with granular shale laminations.		
400 - 500	Limestone - light green-blue grey, waxy lustre.		
500 - 600	Limestone - or lm, dolomite, very finely xln, tight, irregularly platy, weathers orange.		
600 - 670	Dolomite - shaly and blocky, interbedded, very orange weathering. Blocky beds definitely dolomite. Shaley beds are lm, with purple stained laminae, irregularly slabby.	145' Dolomite - green grey, very fine xln, blocky - massive; interbedded with dolo, platy, lm, argillaceous, orange weathering.	
670 - 700	Dolomite - as above, light green grey.		
700 - 730	Dolomite - mostly argillaceous, irregularly platy, orange weathering.	95' Dolomite - green grey, argillaceous, irregularly platy, orange weathering.	
730 - 800	Dolomite - gritty to arenaceous, much quartz in beds, very resistive.	140' Dolomite - irregular slabby as above, siliceous to gritty, much quartz in beds, very resistive.	
800 - 900	Dolomite - irregularly slabby, siliceous.		
899-1080	Contact with brown weathering material		
	Dolomite - very light tan, medium to coarse xln to sucrose, may be inter-xln porosity, followed by dolomite, tan, sucrose, massive, weathering yellow with solution cuts.		
1080 - 1200		140' Dolomite - tan to black, sucrose, porous, with trace chert nodules, weathers yellow brown.	
	Dolomite - as above, with trace chert nodules parallel to bedding. Much white quartz debris.		
1200 - 1400	Dolomite - black, sucrose-sandy, with porous beds.		
	Dolomite - black, coarse xln, fossiliferous with many small spherical knobs of chert similar to silicified corals, one inch in diameter		Macluritus sp. U. Ordovician
1400 - 1600			
	Dolomite - black and tan, interbedded, massive.	265' Dolomite - black and tan interbedded; coarse xln, tight, chert inclusions as before, weathers brown - tan.	
1600 - 1800			
	Dolomite - as above, black weathering beds no longer interbedded below 1950',		
1800 - 1950			
1950 - 2000			
2000 - 2075	Contact brown weathering dolomite above, grey weathering dolomite below.		
	Dolomite - black, coarse xln, tan weathering, massive, abundant coral type chert inclusions.	135' Dolomite, black, coarse xln, massive, brecciated in part. Abundant coral type chert inclusions, generally grey weathering with trace argillaceous tan weathering beds.	
2075 - 2200			
2200 - 2270	Dolomite - black, sucrose, grey weathering, quite rubbly weathering with oblique orange weathering laminae and patches. Semi-brecciated in part. Chert nodules continue. Tan weathering beds still present in minor amounts. One thick bed at 2270' very laminated, brown, soft.		
2270 - 2300	True contact with grey weathering beds at 2300'.		
2300 - 2400	Limestone - milky grey, almost crypxln, but seem fragmental in origin with dark, sub-rounded, medium to fine xln dolomite or limestone inclusions. Possible fossil fragments.		
	Limestone - grey, as above, with dolomite, black, xln and dolomite green, argillaceous, and Shale, dolomitic, blue grey fine grained, hard, slaty, with purple weathering.		

2 of 4

MIDDLE ORD SUNBLOOD

MIDDLE ORDOVICIAN - WHITEROCK ?

670	15 - 650	Dolomite - gritty to arenaceous much quartz in beds, very resistive.	
	15 - 722		140' Dolomite - irregular slabby as above, siliceous to gritty, much quartz in beds, very resistive.
100	15 - 850	Dolomite - irregularly slabby, siliceous.	
	899-1000	Contact with brown weathering material	
		Dolomite - very light tan, medium to coarse xln to sucrose, may be inter-xln porosity, followed by dolomite, tan, sucrose, massive, weathering yellow with solution cuts.	
200	1200		140' Dolomite - tan to black, sucrose, porous, with trace chert nodules, weathers yellow brown.
		Dolomite - as above, with trace chert nodules parallel to bedding. Much white quartz debris.	
	1400		
300		Dolomite - black, sucrose-sandy, with porous beds.	
		Dolomite - black, coarse xln, fossiliferous with many small spherical knobs of chert similar to silicified corals, one inch in diameter	Macluritus sp. U. Ordovician
1000	1600		
		Dolomite - black and tan, interbedded, massive.	265' Dolomite - black and tan interbedded; coarse xln, tight, chert inclusions as before, weathers brown - tan.
400	1800		
		Dolomite - as above, black weathering beds no longer interbedded below 1950'.	
	1950		
500	2000		
	2073	Contact brown weathering dolomite above, grey weathering dolomite below.	
600		Dolomite - black, coarse xln, tan weathering, massive, abundant coral type chert inclusions.	135' Dolomite, black, coarse xln, massive, brecciated in part. Abundant coral type chert inclusions, generally grey weathering with trace argillaceous tan weathering beds.
	2200		
	2270	Dolomite - black, sucrose, grey weathering, quite rubbly weathering with oblique orange weathering laminae and patches. Semi-brecciated in part. Chert nodules continue. Tan weathering beds still present in minor amounts. One thick bed at 2270' very laminated, brown, soft.	
700	2300		
730		True contact with grey weathering beds at 2300'.	
	2400		
		Limestone - milky grey, almost crpxln, but seem fragmental in origin with dark, sub-rounded, medium to fine xln dolomite or limestone inclusions. Possible fossil fragments.	
		Limestone - grey, as above, with dolomite, black, xln and dolomite green, argillaceous, and Shale, dolomitic, blue grey fine grained, hard, slaty, with purple weathering.	
100	2600		
		Dolomite - debris on covered section, slaty as above. Dolomite is tan to blue grey, medium xln to sucrose. Tan material is quite slabby argillaceous. Quartz veins and chert nodules present, but not abundant.	615' Limestone - milky grey, crpxln to fragmental, massive bedded. Interbedded with argillaceous dolomite and dolomitic, slaty shale. Lower part of section fractured, calcite veined, iron and copper sulphides. Section weathers with a light grey color.
200	2785	Creek bed - base chained section on mountain slope.	
300		Creek Bed	
		Dolomite - tan, sucrose, slaty, argillaceous in part; with dolomite, blue grey, medium xln.	
400			
500		Lowest outcrop downstream in creek.	
580		Limestone - milky grey, fragmental, massive bedded. Creek, in part, follows a calcite vein in a fracture zone where copper sulphides have been deposited. Elevation readings indicate a total thickness of 700 feet for the grey beds, 350 feet additional thickness below the lowest station, 2785 feet, on the measured section.	

3 of 3

C.D.P.-16

ROOT RIVER AREA
NORTHWEST TERRITORIES
STRATIGRAPHIC SECTION C. D. P. - 16
ENGLISH CHIEF RIVER

Prepared for Teck Corporation Limited
Canadian Devonian Petroleums Division

Co-Ordinates : 62° 34' N - 124° 35' W
Geographic Location : 6 Miles NW of Iverson Lake (340° AZ.)

Geologists : C.D. Mc Cord, K.W. Campbell.
Date of measurement : June 18, 1963

FOSSIL SYMBOLS

F Fossiliferous
B Brachiopoda
G Gastropoda
Coral
Stromatopora
Foraminifera
Crinoid
Algae

POROSITY SYMBOLS

x intergranular, intercrystalline, interfragmental
v vuggular (greater than 1/16 mm.)
f fractured
p pinpoint
• oil stained or petroliferous

LITHOLOGICAL SYMBOLS

Limestone
Dolomite
Dolomitic Limestone
Argillaceous Limestone
Argillaceous Dolomite
Silty Limestone
Limestone Breccia
Dolomite Breccia
Rugose to Rubbly
Coarse Crystallization
Shale
Calcareous Shale
Anhydritic Shale
Salt Casts
Pyritic
Micaceous
Siliceous
Siltstone
Ironstone
Sandstone
Chert, light or dark

AGE	FORMATION	SECTION THICKNESS	FORMATION THICKNESS	LITHOLOGICAL LOG	COLOUR	FOSSILS	POROSITY (POOR, FAIR, GOOD, VG)	SAMPLE NUMBER	DETAIL LITHOLOGICAL DESCRIPTION	LITHOLOGICAL SUMMARY	PALEONTOLOGICAL RECORD
UPPER DEVONIAN - (Unit 22 - G.S.C. Paper 61-31)									Sandstone - brown with shale laminae containing worm burrows ½" in diameter, flattened. Shale - green, soft, with limestone, greey-grey, medium to fine kln. Sandstone - green, soft, fine grained, in part silty, argillaceous to shaly in part, also contains limy, white laminations. Shale - as above with limestone and sandstone laminae.		

100
200
300
400

1 of

Argillaceous Dolomite | * Coarse Crystallization | P M Pyritic Micaceous | Chert, light or dark

AGE	FORMATION	SECTION THICKNESS	FORMATION THICKNESS	LITHOLOGICAL LOG	COLOUR	FOSSILS	POROSITY POOR FAIR GOOD VG	SAMPLE NUMBER	DETAIL LITHOLOGICAL DESCRIPTION	LITHOLOGICAL SUMMARY	PALEONTOLOGICAL RECORD
UPPER DEVONIAN	ZONE 2 - (Unit 22 - G.S.C. Paper 61-31)	100							Sandstone - brown with shale laminae containing worm burrows ½" in diameter, flattened. Shale - green, soft, with limestone, greey-grey, medium to fine stn.		
		200							Sandstone - green, soft, fine grained, in part silty, argillaceous to shaly in part, also contains limy, white laminations.		
		300									
		400							Shale - as above with limestone and sandstone laminae.		
		500									
		600							Siltstone - green, med granular, argillaceous, soft.		
		700									
		750							Creek level.		
		1000									

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