No. 4

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AERO GEOLOGIC REPORT

ON

OSCAR BASIN AREA

(Essentially same area as Dr. L.R. Laudon's assignment No. 5).

Enclosures: 1 Map

By: Louis Desjardins

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AERO-GEOLOGIC REPORT ON

OSCAR BASIN AREA.

A B S T R A C T

This is a report of aero-geologic study of Oscar Basin area, reviewing the work of L.R. Laudon in the area, adding the information obtained from a detailed topographic (contour) map, and detailed stereo study of aerial photos. The accompanying map comes near realizing an ideal of joint contribution of field work and aero-geology. Laudon's stratigraphic work is accepted, and his major areal mapping and structure, but changes are made in his structural relations between Morrow and Cleaver Mountains (eliminating his oblique intersecting thrust fault), and his basin structures (eliminating his fault extending from Cleaver Mountain far out into Oscar Basin, and suggesting different structural axes within the basin). The major axes within the basin are tentatively mapped, these trending parallel to Discovery-Morrow-Cleaver Mountains and not to Richard-Thomas Mountains. These basin structures are apparently broad and more suitable for petroleum prospecting than doubtful extensions of mountain anticlines, and geophysical work along them is recommended.

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Chapter I

SPECIAL FOREWORD & INTRODUCTION

This is the writer's final report on Dr. Laudon's Oscar Basin Area (Morrow Creek-Cleaver Mountain area), and Dr. Laudon had nothing to do with its preparation. The geology has been changed in many details from that of Dr. Laudon's earlier report (file G.C. 43-11), but in spite of this the writer owes the greatest debt to his report as well as to Dr. Laudon's field notebook. Dr. Laudon's work permitted the present report and map to come near realizing an ideal joint contribution of field work and aero-geology. The accompanying map embodies unique features. It is the first map in the region to be drawn on a topographic contoured base, this base map being plotted from photographs by a device that automatically brings every map detail into true map location, correcting for relief and tilt. The overall control was by means of slotted templets. The contouring method used was one devised to give fairly reliable elevations and contours quickly in the absence of field control and on photos uncorrected for tilt. This method is fully described in the writer's separate technical report "Contouring and Elevation Measurement on Vertical Aerial Photographs", our file No. A.R. 7.

SUPPLEMENTARY PHOTOS

The reader is referred to our file of C.P.A. aerial photos for the original topographic contours and original aero-geologic mapping of formations. The contours on these photos have smaller intervals than on the map accompanying this report (usually 10 or 20 ft. intervals on the photos). Geologic annotations are to be found on Photo Set No. 3 and contours on Set No. 4. The map gives numbers of photos at locations of their centers.

Chapter II

T O P O G R A P H Y

Five topographic units comprise the area as follows:

(a) Lowland flats bordering the Mackenzie River.

This averages two miles wide opposite Morrow and Cleaver Mountains and three miles opposite Thomas Mountains. (The corresponding belt beyond the limits of the map varies from zero to several miles and averages about 2½ miles opposite the Discovery Range). This lowland is unusually flat in the area mapped, between 100 and 150 feet higher than the Mackenzie River, whose elevation is about 250 ft. above sea level. (Farther up stream at Norman Wells, this lowland belt has a pronounced and interrupted slope toward the river, lying about 70 feet above the river at the top of the river bluff and 350 feet higher at the foot of the first pronounced dip slope, on the Kee Scarp limestone). A prominent feature of the lowland belt, returning to our map, is a longitudinal chain of lakes at a very uniform elevation (a little under 350 feet), extending on both sides of Oscar Creek. These might represent a temporary supplementary channel of the Mackenzie River during the latter glacial period. The immediate bluff of the Mackenzie River, rising always out of the water's edge, is characteristically steep and comparatively free from ravines, and it exposes bedrock nearly to its top. The glacial drift veneer in the lowland belt is believed to be thin everywhere.

(b) Discovery Range - Morrow & Cleaver Mountains.

These make essentially one continuous range paralleling and bordering the lowland just described. The Discovery Range reaches elevations above 2400 feet about three miles south-east of Morrow Gap, and above 3000 feet opposite Norman Wells (possibly higher at other points). The crest of the range averages 1700 feet for the second mile from the

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Gap, and 1400 feet for the first mile. In these last three miles there is increasing cross-faulting, culminating in the scissors fault which divides the mountain into two crests immediately overlooking the Gap. Throughout most of its length the range presents a glacial sculptured dip slope toward the Mackenzie lowland, with smoother rock dip surfaces above culminating in a jagged crest, beyond which are sheer cliffs and steep talus slopes into the basin on the far side. These typical conditions are seen for the last mile mapped, but toward Morrow Gap the style changes, as the dip slopes toward the Mackenzie greatly steepen, and an irregular east-facing dip slope, not so steep, constitutes the back side of the mountain near the Gap with a very steep 700-foot cliff bordering Oscar Creek at the Gap.

Across the Gap, Morrow Mountain presents a scarp-cliff and steep talus slope toward the Mackenzie for a distance of three miles. The crest of the mountain, and its northeast slopes are irregular, but for the most part constitute dip slopes. The peak overlooking Morrow Gap is 1200 feet high, but a mile further west the mountain culminates at 1350 feet. Beyond this the main crest drops while lying opposite these is a rim interrupting the back slope and enclosing a basin without outlet, some two miles long and a mile wide containing several lakes. The structural causes of these features are apparent in the geology, and the underground drainage is easily explained by the relation to limestone formations. The structure following this back rim converges beyond with the main mountain structure, the latter having passed from a major thrust fault to an asymmetric fold, and the two together merge into one major anticline constituting Cleaver mountain and reaching nearly 1500 feet at the point where the structures meet. At this point the mountain presents a very steep dip slope to the southwest and a gentle dip slope to the northeast, both rather smooth. The Beavertail limestone makes a smooth facing stone for much of the mountain surfaces through here. Going northwestward, the anticlinal axis plunges, and after the Beavertail bed goes under cover, a 200 foot high crescent shaped hogback of Kee Scarp limestone swings around the end of the mountain. The dip slope of this descends to 500 feet, merging with the west end of Oscar Basin, which toward the southwest, drops down to the level of the Mackenzie lowland (350 feet) on a gentle terrace slope.

. There is no evidence to support Dr. Laudon's supposition that the Cleaver Mountain axis continues under the Thomas Mountains. Rather there is indica tion in the topography of the plunging dips of the Kee Scarp limestone that the axis swings sufficiently westward to entirely miss the Thomas Mountains. This point may illustrate one useful outcome of the topographic contouring.

(c) Oscar Basin

This includes the triangular shaped lowland lying between the Discovery-Morrow-Cleaver Mountains on the southwest and the Richard-Thomas Mountains on the north, and largely drained by Oscar Creek (note that a large part of the western end of the basin is also drained by Oscar Creek by a stream flowing out around the end of Cleaver Mountain). No east boundary of the basin is given, though our report does not go beyond Oscar Lake. The basin, however, is part of a much larger basin extending farther southeast. (It continues flanking the Discovery Range to the valley of the Great Bear River and beyond). The elevation of Oscar Lake is about 860 feet and throughout nearly its whole distance Oscar Creek, which drains this lake, is trenched beneath the basin floor. The level of this floor does not slope in harmony with the valley of Oscar Creek, (another point that would not have been noticed without the contouring). For many miles around Oscar Lake, the slope is toward the lake. There is a broad topographic swell connecting Richard Mountains with the northwest end of the Discovery Range, across which the basin floor averages 950 ft. A broad terrace this high or higher extends into the basin from the foot of Richard Mountains, disappearing as a wedge near the east end of Thomas Mountains. South and west of this terrace the basin drops rapidly to below 700 feet and thence gradually to 500 feet at the extreme west end.

Two prominent trenched valleys not now followed by through streams, traverse part of Oscar Basin in a direction parallel to the Mackenzie and out of harmony with the broad slopes indicated. One of these joins the valley of Oscar Creek, at its nearest approach to Richard Mountain, with a valley which now drains out to the northwest north of Thomas Mountain (Hanna River). The other joins the valley of Oscar Creek, a mile or two below "Hairpin Bend", with the drainage lying northwest of Cleaver Mountain. These abandoned valleys are considered to be temporary glacial river channels.

(d) Richard and Thomas Mountains.

These mountains have east-west trends, and together with other ranges farther east on the same trend, interrupt at an oblique angle the larger basin mentioned above, of which the Oscar Basin is a lobe. A short distance off the map at the east end the Richard Mountains are abruptly terminated. (After a gap of about two miles there is a range called Robert Mountains range which continues their trend. This range is thrust to the north. Richard Mountains to the south). Richard Mountain is mostly a double crested mountain with a central strip of deep sinks in lower Bear Rock salt and gypsum beds. The northern ridge consists of one or more sharp clean hogbacks of Beavertail or Ramparts beds at widely different levels, the highest point above 1600 feet. The southern ridge has a more even keel and consists of the faulted asymmetric axis of the mountain. The mountain is less than three miles long.

The next four miles to the west, while possessing mountain structure, consists only of low irregular hills, except for one hogback of Ramparts limestone which reaches 1400 feet. This difference in topography is caused by the lessened steepness of the dips on the north flank, the local absence of the dolomite phase of the Bear Rock (which is replaced by an unusual thickness of underlying salt gypsum) and the failure of the next underlying Mt. Ronning beds to be brought to a great height above the surface. A large part of this area abounds in sinks. A broad low gap occupies the west end of the four mile section being considered. An old glacial valley traverses this gap, along which, a mile to the northwest, is the Hanna River divide. The gap area itself is drained by a very crooked stream whose course reflects the structural complexity of the zone between the Thomas and Richard Mountain structures. The elevation of the gap is about 750 feet.

Thomas Mountain does not rise much above 1200 feet. Except for a rather uniform scarp slope (passing into equally uniform and equally steep dip slopes at either end) on the south side, the topography is disorderly in the extreme. The north side of the mountain presents scattered hogbacks and intermediate sinks, generally with east-west trend.

(e) <u>Basin north of Richard and Thomas Mountains</u>

This is part of the Upper Hanna River - Moon Lake basin, only the south part here included. This part occurs on two distinct levels. The lower at about 850 feet, lies just north of the Thomas Mountains, and extends a short distance across the Hanna River valley which trenches the basin over 100 feet. At about the position of the anticlinal axis (Smith's Greenhorn Anticline), at which Kee Scarp or lower beds are brought to the surface, the basin rises to over 1000 feet. Throughout this upper part of the basin the floor is less level, and here the outcropping formations are lower in the series. The large Moon Lake in this part of the basin has an elevation of nearly 1000 feet.

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Chapter III

S T R A T I G R A P H Y

As this is an "aero geoligic" report, the emphasis is not on stratigraphy in a lithologic sense, but rather on the manner in which the several formations are expressed in the topography and distinguished on aerial photos. The essential lithologic facts are described in Dr. Laudon's report. They must be ascertained, however, before the full meaning of photo interpretational criteria can be understood. The boundaries between formations must be decided in the field, and then associated with photo criteria.

The lowest exposed formation, Mount Ronning according to Laudon, is of uniform character throughout the area, and consists of well-bedded dolomites, and occasional limestone and other beds. These characteristics are expressed in well-defined photo characteristics. The Mount Ronning outcrop is seen as a great thickness of hard beds, in many layers, always with strong, usually mountainous, topographic expression. (The "beds" and "layers" seen on photos would each be zones of many beds or layers counted in the field). The Mount Ronning is very seldom covered with vegetation. Its upper boundary is always distinct.

The Bear Rock formation varies within this area from typical "fanglomeritic" dolomite near Morrow Gap, and rather well-bedded dolomite and subordinate conglomerate in Cleaver Mountain, to mainly evaporites in the Thomas and Richard Mountains where sink holes are common. The sink holes, mentioned by Laudon are of course an excellent photo criteria, and serve to distinguish Bear Rock from any formation immediately above or below. Where the conglomerate is present, it is entirely unbedded, and makes irregular and sometimes jagged topography. It appears to be variable in its hardness or strength - next to each other will be one mass standing up as a pinnacle several hundred feet high and another mass in which a valley or sink has been eroded for no other reason than the presence of such lithologic weakness. These pinnacles have been termed "hoodoos" by the field geologists. Glacial action more than ordinary weathering has reduced the Bear Rock to such topographic extremes. Small sinks are frequent in the conglomeratic Bear Rock. In the evaporites of the Richard and Thomas Mountains, sinks are larger and more abundant. Photographic evidence indicates that the evaporites always underly the conglomerate, suggesting that they are separate formations. Bedding can be seen in the evaporites. Typically evaporites when present occur to the exclusion of the conglomerate, and the opposite to this, of course, is the general regional condition. However, at a few places in the Richard-Thomas Mountain area, the two can be seen together, with the conglomerate above. (This relation is also described by Dr. Smith in areas to the west).

The Ramparts formation is described as being underlain and overlain by unconformities, and consisting of a basal hard limestone member, middle soft shaley coralline member, and upper hard Beavertail limestone member, the last often coralline. On the photographs, a thin layered zone of hard beds (basal Ramparts) resting on Bear Rock type, is the rule. There is no evidence of unconformity, however, as this relation is prevelent through the whole region. The middle Ramparts is a clean-cut zone of weak rocks, usually valley-forming. Occasionally, however, a thin hard bed or two in the middle of this zone, will have considerable local extent. The hard zone at the top of the Ramparts, called Beavertail in Laudon's and several others' reports, is a conspicuous and characteristic marker on photographs, in fact, the best bed so to trace in the entire region. It always has clear topographic expression, and is of a persistent lithologic type. The writer suspects that the coralline phase described by Dr. Laudon is a local overlying member rather than a lithologic change in the main member. (These local immediately overlying hard beds are frequently seen). No noticeable overlying unconformity is observed.

The Lower Fort Creek shale, according to Dr. Laudon, may rest unconformably on beds as low as Middle Ramparts. This, the writer believes, is untrue, and a result of errors in Dr. Laudon's field work along Oscar Creek. The beds referred to Middle Ramparts, the writer believes, are at the horizon of the Kee Scarp. The Lower Fort Creek shale outcrop by photographic criteria, is negative, and is covered with vegetation except on steep lower slopes of Kee Scarp cliffs.

The Kee Scarp limestone is reported to be a porous coralline limestone, sometimes with poor bedding, of greatly variable thickness, and sometimes entirely absent. The photo characteristics are consistent with this. However, in areas where the formation is reported absent in the field, faint outcrop bands can usually still be traced on the photos at the same horizon. For this reason, the Kee Scarp horizon has been mapped without interruption on aerial photos through the entire region. This horizon never descends to a position in contact with the underlying Beavertail, as Dr. Laudon describes on the northeast side of Cleaver Mountain, but maintains an average 400 or 500 feet interval above this bed. The beds seen on Cleaver Mountain represent a local coral reef on the Beavertail.

The Upper Fort Creek shale offers no photo criteria whatsoever. Its outcrop is uniformly covered with dense vegetation. Outcrops would be found in the field only along creek banks, and on the photos these would be featureless.

The Norman sandstone was described from a single outcrop in the Oscar Basin by Dr. Laudon. The stratigraphic position assigned seems entirely reasonable on the photographs. Faint outcrop bands, with definite topographic expression, (often revealed by contours on a 10 foot interval) are traceable here in the direction of strike given by Dr. Laudon, and for long distances within the basin. They form the basin for the tentative areal mapping shown within the basin. The Norman formation in this area probably consists of more shale than sandstone, the latter in rather weak beds. These offered very little resistance to the grinding of the glaciers, and there has not been sufficient time since the glaciers' removal for weathering to accentuate the Norman sandstone outcrop to its fullest degree.

The Cretaceous was not reported in the area. The writer found no reasons for assigning any of the Oscar Basin surface to Cretaceous. The basins north of the Richard and Thomas Mountains are definitely Devonian. The bank of the Mackenzie River, within the limits of this area, is Cretaceous, according to Hancock. He infers the Devonian-Cretaceous boundary to parallel the river a short distance inland. The writer found nothing mapable within the Mackenzie River lowland belt.

Chapter IV

AREAL AND STRUCTURAL GEOLOGY

The larger general patterns of structure are fairly well described in Dr. Laudon's report. The present description will follow the same subdivisions of the area used in describing the topography.

(a) Mackenzie River lowland. As just mentioned, a narrow strip, immediately adjacent to the Mackenzie River is probably Cretaceous. Between this and the mountains a complete section of Upper Devonian is probably present. Though dips are mainly toward the river, it is very likely that a synclinal axis lies closely along the base of the mountain front of Cleaver and Morrow Mountains (but not the Discovery Range), as such synclines are associated with the forward sides of thrusted or asymmetric folded structures. If such a synclinal axis is present, an anticline would lie just beyond to restore the south west dip.

(b) The Discovery Range at its northwest end, shows a progressive change from the single thrust fault structure farther southeast, where the thrust is to the northeast. Several cross faults occur on the southwest side of the mountain, each one indicating a measure of force directed southward. At the end of the mountain this force equals that producing the principal mountain thrust, and the main mountain fault reverses itself as one continues along Morrow Mountain. These cross faults on Discovery Range were not previously mapped, nor the great southward bulge of Mount Ronning extending to below the foot of the mountain and cutting out all higher beds. In this bulge the Mount Ronning beds dip southwest with accentuated steepness.

The Morrow and Cleaver Mountains form a structural unit, and not two units separated by a major fault as appearing on Dr. Laudon's map. The structure is an asymmetric anticline leaning toward the southwest.

broken by a thrust fault in this direction in the Morrow Mountains. This fault plane is high up the mountain side and vertical outcrops of Beavertail and Kee Scarp beds representing the steep limb of the anticline extend the full length of the mountain, sticking up through the talus below this fault at a number of places, which are shown on the map. At its eastern end, the top of Morrow Mountain is made of Mount Ronning beds, but a short distance westward the mountain crest passes to Bear Rock beds, which it follows for the next three miles. (Dr. Laudon carried the mountain crest on Mount Ronning beds this entire distance). The Mount Ronning outcrops as a band above the fault and well beneath the crest. Northwest of the termination of this fault the crest of the anticline continues sharply folded until it commences its northwest plunge at the end of Cleaver Mountain. The very steep southwest flank is faced with the Beavertail layer in large part, but this is removed northwest of a cross fault, as shown, where Ramparts and Bear Rock windows are exposed. The northeast flank of the mountains is not a simple gentle dip slope, but a complication of minor folds with plunging axes, and a longitudinal fault of two miles length. (There is no major obliquely transverse fault as mapped by Dr. Laudon). The map shows the actual structural details, both in the areal geology and in the topography. These minor structures combine in a single anticline which joins the principal mountain anticline on the highest peak of Cleaver Mountain, nearly 1500 feet high. Northwest of here the structure is a simple fold becoming symmetrical as it plunges or dies out. It has been noted that its possible continuation is more apt to swing parallel to the Thomas Mountains than to pass beneath them.

(c) The Oscar Basin presents interesting scattered limestone outcrops along Oscar Creek and on a bluff three-quarters of a mile southwest of

Hairpin Bend, as mapped by Dr. Laudon, and all referred to Ramparts or Beavertail. To Dr. Laudon these seemed to require a fault extending far out into the basin. The writer traces the Kee Scarp horizon with very high probability to all these locations and has the support of other geologists who have seen the Oscar Creek outcrops in the field. As stated previously the areal geology generally in Oscar Basin is mapped on the basis of very poorly expressed trends. Adding all these up with the dip directions supplied by Dr. Laudon gives fairly definite indications of the several structural axis traversing the basin. The trends are parallel to the Discovery-Morrow-Cleaver Mountains, not to the Richard-Thomas Mountains. The longest and dominant axis is a syncline here called Oscar syncline extending from the Thomas Mountains to the uppermost valley of Oscar Creek. Farther southeast it is believed this syncline reaches and follows the foot of the Discovery Range, with the dropping out of the suggested anticline paralleling it, causing the extended Oscar Basin to possess a long gentle regional dip to the southeast, culminating to the northwest in a long range of mountains paralleling the Discovery Range.

The syncline seen in the field near Foley Falls is believed to extend beneath the main thrust of the Discovery Range, and to die out in the other direction. Since all dips in the vicinity of Hairpin Bend are to the northeast, an anticline is indicated between here and the Foley Falls syncline. The photographic evidence places this near the latter, and its doubtful extent in both directions is indicated. To the southwest these basin folds are interrupted en echelon toward the Thomas Mountains. All these basin axes probably represent broad, gentle folds of low dip.

(d) The Richard Mountains constitute a sharp, short, oblique (east-west) interruption to a long regional south-west dip from a major mountain anticline four miles northwest, into the Oscar syncline. (These relations beyond the map are well seen on trimetrogon photographs). An important syncline, here called the Moon Lake syncline, lies approximately along the edge of our map. This converges on the eastern end of Richard Mountains and both this axis and that of Richard Mountains probably disappear eastward in favor of the unbroken dip slope. The Richard Mountains proper are at the eastern end of a large triangular shaped fault block having a long north dip. This dip is steeply upturned on the north slope of Richard Mountains, along the crest of which the anticline is faulted because of the crushing and slipping of the Bear Rock evaporite beds. These are squeezed against the down side of the fault. Mount Ronning beds lie against the upside. The outer end of the fault block carries several sharp local folds which may or may not match folds across the fault toward the Thomas Mountains.

The Thomas Mountains are mainly a strongly curved anticline asymmetrical toward the south, and thrusted in this direction in its central part. At both the east and west end this fault is replaced by a folded axis which brings steeply dipping Beavertail and Kee Scarp beds to the south or southwest side of the mountain. (In the central thrusted portion these pass under the Mount Ronning). The west end is complicated by oblique crossfaulting of considerable displacement, and the east end by right-angle cross faulting of very little displacement. The stresses indicated by the horizontal displacements of these last are not clear, but a skillful stress-analysis might relate these to the conflicts between the northwest-southeast and the east-west elements in the region. The writer does not believe that the Richard Mountain structure has over-ridden the Thomas Mountain structure as Dr. Laudon has assumed, as though the structures were produced at different dates, but believes the entire complex picture time beneath the Richard Mountain block, because both the principal Thomas Mountain anticline and the subordinate anticline north of it plunge steeply as though terminating a considerable distance before the fault block is reached. (Dr. Laudon's edge of this fault block is too far to the west).

(e) The basin north of the Richard Mountains has already been discussed. The basin north of the Thomas Mountains, surrounding Moon Lake, has been mapped by Dr. Smith, except that the present map offers much more complete and corrected detail of areal geology and structure in the vicinity of Thomas Mountains. The Greenhorn Anticline is sharply defined all the way to the Richard Mountain fault, and an equally well defined syncline likewise. The pattern of Kee Scarp through here is quite different from Dr. Smith's. Locations of good outcrops not visited in the field are indicated on the map.

Chapter V.

RECOMMENDATIONS AND ECONOMIC POSSIBILITIES.

Comparison of Dr. Laudon's map with the present map will not provide very favorable structural support for the location of his two proposed drilling sites. That near the Thomas Mountains (No. 2) is certainly closer to a synclinal axis than to an anticlinal. The other is probably also synclinal.

The writer is not offering any particular drilling locations, but rather recommends all the suggested anticlines within the Oscar Basin as favorable for geophysical surveying. The present study, as well as a large amount of aero-geologic work in the region, has led to the general observation that broad, gentle and sometimes domed anticlines are characteristic within the basins or lowlands between mountains. Examples of these anticlines have been found, besides those in the Oscar Basin, in the lower Carcajou valley, Mountain River valley and elsewhere. In many cases the rim of a basin is synclinal adjacent to the sharp-folded bordering mountains, with the major part of the basin broadly anticlinal or else doubly anticlinal with a central syncline.

The writer believes the greatest petroleum possibilities of the region are not along possible extensions of the mountain anticlines, but along the basin anticlines. Aero-geology can usually tentatively locate these anticlines on the basis of faint topographic trends, but no method of surface geology, either in the field or on photos can map this type of terrain, due to a practically total lack of outcrops. Wildcat drilling without seismic work might be ventured at places where these anticlinal belts appear to broaden out, but seismic work should be employed first if the opportunity avails.


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Moon Lake Syncline
MOON LAKE
RICHARD MTS.
Green Horn Anticline
Oscar Syncline
OSCAR LAKE
THOMAS MTS.
Oscar (Morrow) Creek
DISCOVERY RANGE
MORROW MTS.
CLEAVER MTS.
Probable DEVONIAN-CRETACEOUS Boundary
MACKENZIE RIVER
AERO-GEOLOGIC MAP
OF
OSCAR BASIN AREA
GEOLOGY AND TOPOGRAPHY BY LOUIS DESJARDINS FROM AERIAL PHOTOS
RADIAL CONTROL AND CARTOGRAPHY BY ROBT. MERRILL
CONTOUR INTERVALS: 50 AND 100 FEET
(Smaller Intervals On Original Photos)
DATUM: APPROX. SEA LEVEL
SCALE: 1:31680 OR 2 INCHES=1 MILE
LEGEND
DEVONIAN
SILURIAN
Dn Norman Sandstone and Shale.
Dfc Ft. Creek Shale.
Dks Kee Scarp Limstone or Equiv. Horizon.
Dlfc Lower Fort Creek Shale.
Dbt Beavertail Limestone.
Dr Ramparts Formation.
Sbr Bear Rock Formation. (Sbr-g = gypsum)
Smr Mt. Ronning Formation.
Photo Centres.
Formation Boundary; Doubtful.
Structural Axis; Doubtful.
Fault; Doubtful.
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