GEOLOGICAL, GEOCHEMICAL & GEOPHYSICAL REPORT ON THE MINK CLAIM GROUP

Claim Sheet 116-K-1
~~104~~ 140° 10'W - 66° 10'N

John R. O'Donnell

May 30th - July 21/73

This report has been examined by the Geological Evaluation Unit and is recommended to the Commissioner to be considered as representation work in the amount of $ 21 42, 00.00

Resident Geologist or
~~Resident Mining Engineer~~

Considered as representation work under Section 53 (4) Yukon Quartz Mining Act.

Commissioner of Yukon Territory

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LOGISTICS AND PERSONNEL

The field program commenced on May 30, 1973, with the party manager flying to Whitehorse by commercial airlines to make logistical arrangements for the supplying of groceries and propane for the field party during the following 51 days. Radio call signs for CNT radio telephone connections with Whitehorse and Inuvik were also applied for and land use permit finalization was approved by the Department of Indian Affairs and Northern Development.

On May 31, the balance of the field crew departed from Calgary on Inexco Oil Company's Hawker Siddley 748 aircraft with a full 8,000 pound load of camp gear, food supplies and technical equipment. The large aircraft was unable to land on the Mallard airstrip in the Ogilvie Mountains because of soft muddy spots and the general rough condition of the runway. The crew and equipment were dropped off at Dawson City, 130 miles to the south as an alternative measure.

The field party arrived at the Mallard airstrip the following day, June 1, via Trans Northern Turbo Airway's Twin Otter chartered out of Whitehorse, 420 miles to the south. Four round trips were required from Dawson City so it was late in the evening before the last load arrived at the proposed camp site.

A Bell 206B Jet Ranger helicopter, contracted from Dominion-Pegasus Helicopters of King City, Ontario, was used for daily transportation of personnel and field equipment from the base camp to the various areas investigated.

Weekly supply flights were provided by a fixed-wing Aztec aircraft owned by Trnas North Turbo Airlines operating out of Whitehorse, 420 miles to the south.

Aviation fuel (95 drums) for the helicopter operations were cached at the Mallard airstrip by Inexco Mining Company before the spring "breakup". The winter road leading west from the Dempster Highway was utilized in the trucking of this fuel to the camp site.

An additional six kegs of regular gasoline were flown in at the time of the camp set-up to operate the small radio generator plant (1.2 Kw). The base camp radio was a Marconi CH 25, 100-watt transmitter-receiver tuned to six frequencies. A 78-foot long dipole antenna strung between two 40-foot high masts or antenna poles was connected to the radio by way of a SAT-3A antenna tuner which enabled the used to rapidly switch frequencies. Radio operations were poor in this remote part of the Yukon Territoty.

The field program was carried out by J.R. O'Donnell, G.O. Raham and B.J. Jones, geologists employed by Geophot Services Ltd., aided by three student assistants, F. Taxbock, E.N. Taylor and M.R. Martin. Support personnel consisted of L. Pederson, cook, J. Carnie, pilot and B. Towson, engineer. J. Carnie, the pilot for Dominion Helicopters was replaced by P. Swift approximately half way through the field season.

GEOCHEMICAL PROCEDURES

The 1973 Ogilvie Mountain program was designed as a detailed prospecting and follow-up operation with geochemical sampling as one of the primary techniques of further exploring the claim groups and other areas of interest. A total of 1,931 geochemical silt samples were collected during the field operations.

The silt-sized material collected consisted of both true stream sediment samples and soil samples, as well as third category of sample, fitting somewhere between these end points. Many of the hill-sides and talus-covered slopes that were sampled contained small intermittent rivulets and surface run off areas (sheet wash) that carried silt-sized particles of sufficient quantity for geochemical sample collection. True residual soil zones were present on some of the anomalies and claim groups and good quality soil samples were obtained from these areas not influenced by transported material. All the active tributary streams associated with the anomalies and areas investigated carried true silt-sized stream sediment material ideally suited for this type of geochemical sampling.

At the time of collection all geochemical sample material was placed in suitable sized canvass bags and labelled with an identifying sample number. Later at the base camp, these samples were oven dried at temperatures between 200° and 225° F to remove all moisture content. The samples were then seived to a -80 mesh fraction and placed in small heavy paper envelopes for shipment to the Ceophoto AA laboratory in Calgary.

A 0.5 gram portion of each seived sample was disgested in 1:1 nitric acid at 90^{o} for 1 hour, then diluted with distilled water to 10 ml, a 20 x dilution factor.

The samples were then stirred and allowed to settle prior to analysis for copper, leas and zinc on the Perkin-Elmer Model 303 atomic absorption spectrophotometer. The results were reported in parts per million (ppm) of copper, lead and zinc. Lists of these geochemical results were sent to the field party on the weekly supply flights. Direct reporting of assay values by radio was not possible this summer due to the poor radio conditions encountered in the Ogilvie Mountains.

A portion of the samples collected during the 1973 field operations were assayed by cold extraction geochemical methods. This test was conducted either directly in the field prior to bagging the sample for later hot extraction AA analysis or at a small field laboratory set up at the base camp. When conducting this cold extraction analysis, only the readily extractable metal ions are taken into solution utilizing Bloom's Total Heavy Metal (THM) buffer solution followed by titration with 0.001% dithizone solution. The results are recorded as milliliters of dithizone solution required to titrate to a green end point. This test only served as a quick semi-quantitative test to determine if a particular tributary or area might be anomalous in combined copper, lead and zinc. No cold extraction results are reported in this report or accompanying maps because all samples collected this year were later assayed by hot extraction AA methods and the quantitative parts per million results are far more significant.

Using the method of Lepeltier (1969), cumulative frequency diagrams for the three elements, copper, lead and zinc were plotted. This method utilized a logarithmic probability graphical representation of the geochemical data to establish anomalous threshold levels and background values.

The background and threshold values utilized in evaluation of 1973 field data are as follows:

Element	Background	Threshold
Copper	18 ppm	46 ppm
Lead	18 ppm	40 ppm
Zinc	80 ppm	270 ppm

A total of 83 rock samples collected during the 1973 summer field season were assayed by the Geophoto Services AA laboratory in Calgary. The rock samples were pulverized to -100 mesh. In most cases, the field party retained a portion of the original sample for examination at a later date, if desired. A 0.5 gram portion of the pulverized sample was digested in a 50% aqua regia solution for one hour and then diluted to 20 ml., a 40 x dilution factor. The samples were then stirred and allowed to settle before analysis using the Perkin-Elmer Model 303 atomic absorption spectrophotometer with digital concentration read out providing analysis values directly in parts per million.

Many of the rock samples were analyzed for trace element content of copper, lead and zinc for the same purpose as geochemical silt samples. These samples were recognized as not being mineralized but were collected and assayed (rock geochemistry) as indicators of favourable horizons or structural conditions. Other rock samples contained obvious signs of mineralization and were assayed for the smae purpose that a commercial laboratory would be employed.

FOLLOW-UP PROCEDURES

With a six-man field crew it was possible to use two or three field teams on different areas at the same time. The normal sequence of operations was for all isx geologists or 2 to 3 man teams to be flown out daily by helicopter to their respective work areas. The helicopter normally remained with one of the field parties to move men in the work areas as required.

The examination and geochemical follow-up sampling conducted on the various anomalies and areas of interest involved a geologic appraisal of each area including detailed prospecting and selective sampling of all accessible surface outcrops and talus areas.

The geologists conduction field work on the specific anomalies or areas of interest would inspect and sample the more critical rock outcrops, as well as gather geochemical soil and stream silt samples to substantiate or rule out anomalous conditions. The density and overall pattern or distribution of this sampling was flexible as required to further localize or trace the extent of known surfa ce mineralization or anomalous conditions. Selected samples were tested by cold-extraction analysis in the field and all samples were later assayed by hot extraction atomic absorption analysis. The Geophoto Services AA laboratory in Calgary served as the support facility for the field operation.

The claim groups of necessity involved considerably more man-days than any of the individual anomalies and other areas of interest that were investigated. This work on the claim groups consisted of conventional prospecting procedures to localize potential indications of mineralization and follow those trends laterally as far as possible. A geologic appraisal of each claim group as a whole also aided in determining the possibility of extensions of mineralization along favorable horizons or structural trends.

Geochemical sampling on the claim groups involved a collection of both random samples from the various portions of the claim group, as well as, detailed soil samples on a grid system basis.

Portions of the Mink Claim Group were feasible for EM and magnetometer surveys which were conducted along a fairly extensive grid system. The Bear Claim Group was not suited for these geophysical surveys.

Trenching operations were conducted utilizing an Atlas-Copco plugger drill followed by blasting in mantled areas of suspected mineralization. Hand excavated prospect pits were also dug where drilling and blasting would have been dangerous or impractical.

MINK CLAIM GROUP

Introduction

The Mink Claim Group consists of 80 claims (see Figure 24) covering an area of copper and zinc mineralization located along the northwestern trending axial core of the Mink Anticline. This claim group is located in the southcentral portion of the 1969 project area (NTS quadrangle 116K/1) near the headwaters of one of the main tributaries of the Fishing Branch of the Porcupine River. The location of the claim group in reference to the Mallard base camp is shown on the location diagram, Figure # 1.

Inexco Mining Company subsequently examined the area of Permo-Pennsylvanian carbonate along the apex of the Mink Anticline and noted both copper and zinc-bearing float associated with the small knob at the south end of the Paleozoic core of the structure. Assay results of this material were very encouraging the eighty claims designated the Mink Group were staked to protect the area during the early spring of 1973. One of the top priorities of the 1973 Geophoto field program was to collect all possible geologic, geochemical and geophysical data on the Mink Claim Group that would aid in the assessment of this mineralization. The second priority was to prospect the Mink Anticline Area as a whole for additonal occurrences of mineralization or extensions of the previously examined mineralization.

The professional claim stakers employed by Inexco Mining Company to stake the Mink Claim Group conducted their work under winter conditions and the post were surveyed in bot not set up. The first task confronted by Geophoto Service personnel was to set upright and tag all the claim posts on the Mink Group. A claim location diagram plotted on a 1 inch to 2,000 feet topographic map and the claim tags were provided by Inexco Mining Company prior to beginning field operations. A claim map covering NTS sheel 116K/1 was obtained from the Yukon Mining Recorder in Whitehorse. This 1 inch to 1/2 mile claim map showed the tag numbers corresponding to respective claims, but as is usually the case, the base map consisted only of a enlargement of the appropriate protion of 1:250,000-scale topographic map sheet Procupine River (116J and 116K - E1/2).

A total of 68 man-days of work was conducted on the Mink Claim Group, of which 28 man-days were devoted to prospecting and geochemical sampling, 22 man-days involved geophysical surveys and grid layout and 18 man-days were utilized in trenching operations.

Geology

The Mink Claim Group is located near the southeastern end of the 8 to 10-mile long Mink Anticline (see Figure 24). The claim group proper spans a 21,000 foot by 9,000 foot northwesterly trending area at this southern end of the structure.

The oldest rocks exposed along the axial core of the Mink Anticline consist of light-grey to yellowish-brown-weathern limestones to the permo_Pennsylvanian-age Ettrian Formation. The rounded elongate outcrop area or ridge exposed here is heavily mantled by extnesive talus slopes limiteing a detailed study of the formation to small scattered outcrops (see Figure 25). These exposures revealed a fine-to mediumgrained limestone that in places consists almost entirely of bioclastic fragments in a sparry calcite matrix. Fine-granined, study limestone horizons were noted at two or three outcrop localities. Dark grey-weathering irregular chert lenses were quite common througout the stratigraphic sequence of Ettrain Formation carbonates outcropping at the south end of the Mink Anticline.

Although the Permian-age Jungle Creek Foramtion is not reported to be present in the Mink Anticline area, evidence collected during the 1973 field program stongly suggests the presence of this formation occurring along the eastern flank of the central carbonate core of the Mink Anticline. Abundant fragments of chert-pebble conglomerate, siliceous mudstone and siltstone were noted along the faulted southeastern flank of this structure (Claims 36 and 38). The stratigraphic break (see Figures 24 and 25) located along the northeast flank of the central core area (Claims 48 and 50) consists of a darker-toned zone of siliceous siltstone and shale also suspected to represent the lowermost Jungle Creek Formation. Field examination of poorly consolidated exposures in this vicinity verified the typical Jungle Creek lithology of the unit. The likelihood of similar Jungle Creek exposures occurring along the western flank of the structure exists, but the heavily mantled lower protions and talus covered upper zones along this flank did not reveal any obvious evidence of their presence.

A fairly large outcrop area of Upper Triassic age shales, siltstones and limestones, is limited to the north end of the Mink Claim Group.

This map unit has been incorporated into Fugures 24 and 25, but only a brief examination of these exposures was made. Outcrops of Triassic-age black fissile siltstone and shale with interbedded shaly limestone were examined along the north bank of the main easterly-flowing stream and in the vicinity of the hilltop 1,800 feet further north. No fossils were noted but Upper Triassic Halobia sp. are reported from similar rocks in the Monster Syncline area to the south (Mountjoy, 1969).

The broad recessive area between the central area of Permo-Pennsylvanian carbonates and the outer ridge of resistant sandstone and orthoquartzite is underlain by a fairly thick sequence of dark grey to bluish grey, friable shales designated as the Husky Formation. This unit is of Lower Cretaceous age but may include some Jurassic beds as well. Dark bornw to rusty brown-weathering horizons or bands were noted at several localities at the south end of the structure where fairly good outcrops of the Husky Formation occur. These bands consist of a more siliceous shale horizon that contains occasional concretions of rusty colored ferruginous siltstone. The stratigraphic break (SB) shown along the southern and southwestern portions of this recessive strike valley (see Figures 24 and 25) represents a horizon in which the dark shales grade into medium to light grey sandy siltstone with interbedded dark grey sandstone or greywacke. Dark grey to black shales and sandy siltstones occur stratigraphically above this marker bed or zone.

The prominent hogback ridge that encircles the southern end of the Mink anticline consists of a fairly thick sequence of combined silty sandstone and quartzose sandstone known as the Martin Creek Formation. The upper portion of these Lower Cretaceous-age sandstones consist of light grey to white or buff colored quartzose sandstones and orthoquartzites. The sandstones appear to be slightly carbonaceous in some localities. The lower part of this formation consists of dark grey to buff brown-weathering silty sandstones with thin laminae and thicker layers resembling graywacke. Crossbedding and poorly preserved ripple marks were noted in this lower portion of the sandstone unit.

The youngest formation outcropping in the vicinity of the south end of the Mink Anticline is the Lower Cretaceous (Neocomian age) Goodenough Formation. The formation was only briefly examined while collecting geochemical samples along the northeastern flank of the structure (see Figure 25). At this locality thrusting has carried Martin Creek Formation sandstones over the younger shales and sandy siltstones of the Goodenough Formation. This lower part of the Goodenough Formation appears to be a transitional zone above the Martin Creek sandstones and consists of sandy siltstones and shales with some interbedded layers of flaggy sandstones. The ravines below and low-lying area further east (stratigraphically younger) appear to be made up of a thick monotonous sequence of dark grey to black shales.

Structurally, the south end of the Mink Anticline consists of a relatively broad fold with a fairly steep and partially overturned northeastern flank. Along this northeastern flank competent sandstones of the Martin Creek Formation have been thrust over younger incompetent shales of the Goodenough Formation. North-northeast trending normal faults with the upthrown side to the northwest have offset the resistant hogback ridge of Martin Creek sandstones at a couple of localities. A comples system of normal and high-angle thrust faults occur at the extreme southeastern end of the anticlinal structure accounting for the breached gap in the ridge so evident here.

The axial core of Permo-Pensylvanian-age carbonates exposed at the centre of the structure is highly faulted and sheared along its eastern flank. A series of north-northwest trending thrusts and shear zones complicate the gologic picture along this mantled zone. Chert pebble conglomerates and siltstones of the Jungle Creek Formation appear to have been preserved along a possible graben-like structure.

The north-south oriented limestone outcrop near sample F 229 at the extreme north end of the carbonate ridge forming the core of the anticline may be fault controlled. Mineralization was noted nearby.

The axial trace of the anticlinal fold follows the crest of the prominent carbonate ridge near the south end of the Mink Anticline. Dips of 5° to 15° were noted along the crest of this ridge, but those steepen quite rapidely along the eastern flank of the structure. Strikes and dips from the heavily mantled western flank of the carbonate ridge were almost impossible to obtain. The lack of outcrops along this side of the structure accounts for the scarcity of structural information occurring there.

GEOCHEMICAL SURVEY

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Geochemical Survey

The geochemical sampling operation on the Mink Anticline may be divided into three categories consisting of: 1) a series of stream sediment and random soil samples collected from Mesozoic tributaries at the south end of the claim group and from the sandstone ridge to the east. 2) A mixture of stream sediment and randomly-spaced soil samples from the main Permo-Pennsylvanian-age central ridge or core of the structure, and 3) a detailed soil sample grid covering the area around the mineralized knob at the south end of the central carbonate ridge and a second grid covering the south end of the northwestern trending shear zone. The geochemical results of these first two surveys are shown on the geochemical sample plane (Figure 25). A total of 293 geochemical silt samples were collected from the first two areas. An additional 229 soil samples were obtained from the two soil sample grids laid out along key areas that cover portions of claims 31, 33, 35 and 36.

All the geochemical silt samples collected from the Mink Claim Group were analyzed in the Geophoto Services laboratory in Calgary using the -80 mesh seived fraction. A 0.5 gm portion was digested in 1:1 nitric acid and then tested on a Perkin-Elmer Model-303 atomic absorption spectrophotometer for the elements copper, lead and zinc. A digital concentration readout accessory gave analysis values directly in parts per million. Statistically determined background and threshold values for copper and zinc established during the 1969 field program were again utlized in evaluating the Mink Group. The threshold values of 46 ppm for copper and 270 ppm for zinc were based on 850 reconnaissance samples collected that year. A revised lead background of 18 ppm and threshold of 40 ppm were established using all the 1973 field program samples except those collected on the Bear Claim Group, a known lead anomaly. All values exceeding threshold level are considered anomalous.

Mesozoic Area - The results of geochemical sampling along tributaries draining the lower Cretaceous outcrop area were not encouraging. Stream sediment samples from the south end of the claim group were in most cases below the background zinc level of 80 ppm. Copper values near or below the background of 18 ppm also predominated. Follow-up silt samples collected along tributaries draining claims 5 and 7 and the area just to the west and outside the claim group proper, reported a slightly higher range of copper, lead and zinc values. Only silt samples A 45 (Claim 5) reported anomalous values of 82 ppm copper, 43 ppm lead and 274 ppm zinc. Sample A 44 taken approximately 600 feet further upstream (to the south), reported relatively well above background values in copper and zinc, but did not reflect the anomalous values taken downstream. Prospecting in this area of Cretaceous shales and sandstones failed to lead to any signs of mineralization.

A series of stream sediment samples were taken along the fairly large stream that parallels the eastern flank of the central carbonate ridge of the anticline. This large tributary flows northward through an area also underlain by Lower Cretaceous-age shales of the Husky Formation. Its proximity to the highly faulted and sheared eastern flank of the Permo-Pennsylvanian carbonate ridge made this stream an attractive sampling area that might possibly reflect anomalous conditions to the west. Zinc trace element values ranging from 57 to 159 ppm are reported along this stream and only the 1969 sample (R 172) at its northern junction reported a slightly anomalous zinc value of 294 ppm. Copper and lead geochemical values along this drainage course likewise reported background to midpoint values. The mineralized knob area (Claim 31 and 33) is located only 1,200 to 1,400 feet to the west of the south end of this stream (see Figure 17) but anomalous conditions occurring there are not reflected by the nearby stream. The lack of side tributaries flowing into this drainage system from the west plus the diluting effect of barren material into this stream are the only explanations offered for this phenomena.

The main western branch of this same stream cuts through the rounded carbonate ridge separating it into two distinct north and south portions. Sample A 66 taken along this western branch at a point halfway through the breached water gap, reported 159 ppm zinc.

All other samples collected along the main course of this western branch reported insignificant trace element values.

A series of stream sediment and soil samples were also collected along the prominent hogback ridge formed by sandstones of the Martin Creek Formation. The sampling was confined to the northeastern flank of the anticlinal structure (see Figure 25). Geochemical silt samples F 278 to F 298 were collected along this resistant ridge top of Lower Cretaceous-age sediments and from the poorly defined alluvial fans and sheet wash rivulets that drain its western slope. These samples were collected slightly outside the eastern edge of the claim group proper and their consistently lower than background values in all three elements suggest that additional claims need not be extended in this eastern direction.

Paleozoic Ridge Area - (Southern Part) - The main geochemical sampling effort was concentrated along the central northwestern-trending ridge of Paleozoic carbonates at the center of the claim group (see Plates 15 and 16). This elongated ridge or series of rounded hills effectively outlines the axial core of the Mink Anticline defined by outcropping Permo-Pennsylvanian age limestones,

The smaller rounded hill or peak to the south of the stream-breached water gap (see Plate 15) is considered first. An excellent density of randomly spaced geochemical soil samples were collected here. Two anomalous copper values were reported in addition to those occurring within the soil sample grid areas proper. Sample B 74 assayed 330 ppm copper and was collected a short distance east of the northern geochemical soil sample grid layout. This anomalous sample is better referred to when discussing the geochemical anomalies along the north grid system. The second sample from this outhern part of the ridge area, reporting anomalous copper, is sample C 317, which assayed 262 ppm. This anomalous sample was collected 120 feet south of malachite-stained float noted during the the geochemical sampling operation and occurs along the heavily mantled western flank of the rounded hill (Claim 10). Samples C 316 and C 318 within 160 feet to the north and south of this location did not report anomalous copper values.

Anomalous zinc values are much more common and widely distributed than copper at this south end of the ridge and occur along both flanks of the elongated northwestern trending carbonate hill. Silt samples C 327, B 73 and B 74 reported anomalous values of 633, 770 and 346 ppm zinc respectively. These three samples occur along the borders of the northern geochemical grid system paralleling the zone of northwest trending shear zones and are more closely related to this suspected area of mineralization than to the anomalous zinc values farther upslope and on the opposite flank of the rounded southern hill.

Geochemical sample C 332, collected 900 feet north and slightly west of this grid system, reported an anomalous zinc value of 291 ppm. Sample C 331, collected 200 feet further south and approximately at the same elevation (3,500 foot contour) assayed 264 ppm zinc. Seventy-five to 100 feet above these samples a series of moderately high but not anomalous zinc values forms a linear pattern along this eastern flank of the hillside. Sample C 346 (266 ppm) is the southernmost of this row of significant zinc values that extend over 2,000 feet in a northwesterly direction.

Three anomalous zinc samples were collected along the western flank of the carbonate hillside, south of the water gap. Samples C 317, C 345 and C 352, assayed 290, 318 and 343 ppm zinc respectively. Sample C 317, mentioned earlier, also assayed high in copper and occurs in the vicinity of reported copper float. Both of the other anomalous zinc values occur up-slope and may reflect the same source as those occurring along the opposite side of this ridge.

The southern elongated hill along this northwesterly trending carbonate ridge exhibits several anomalous lead values. These values ranging from 41 to 486 ppm lead are concentrated along the entire northeastern flank of this limestone hill. Samples C 332, C 340 and C 341, from the northern end of this fault-controlled hillside, reported 218, 341 and 486 ppm lead respectively. Additional samples scattered along a 2,000 foot north-south zone between the 3,300 and 4,900-foot contours reported numerous lead values in the 50 to 80 ppm range. Samples C 329 and B 75 collected not far north and west of the geochemical grid system (north), reported 100 and 132 ppm lead. The highly anomalous and widespread lead patterns reported along this eastern flank are very surprising as no signs of recognizable lead mineralization were noted anywhere on the Mink Claim Group. Structurally this eastern flank of the southern limestone hill is excellent. The parallel series of north-northwest trending faults and shear zones offer excellent potential for mineralization.

Paleozoic Ridge Area - (Northern Part) - The northwesterly oriented limestone ridge north of the breached water gap was likewise thoroughly sampled, (see Figure 25). The water gap (see Plate 15) bisects the Permo-Pennsylvanian-age limestone core into two distinct halves. Both soil and stream-sediment type silt samples were collected here. This elongated northern segment is roughly twice the size of the rounded hill (3, 929') to the south of the water gap. It consists of two distinct rounded peaks (4, 087' and 4, 016') and a rather broadly defined saddle area between these rounded hill tops (see Plate 16). This saddle forms the headwater area for the only fairly well-defined tributary system occurring along the entire central ridge. This twin forked stream (see Plate 16) drains the northeastern flank and was the site of geochemical samples R 196 and R 850, collected in late August 1969. During the 1973 operation this tributary was largely snow covered and impossible to sample.

Anomalous copper values are far more common along this northern half of the claim group. They fall in two main clusters of dispersion patterns each associated with copper-bearing float sample localities discovered during prospecting operations.

Float sample FR 33 of highly siliceous, malachite-stained material was picked up approximately 300 feet south of peak 4, 087'. Similar mineralized material was noted scattered over a 30 to 40 foot area surrounding the sample location (north end of Claim 41). The copper float samples, collected during the short 1969 field season were picked up from this same general area. Soil sample F 378, collected 60 feet south of FR 33, reported a highly anomalous 325 ppm copper. Six additional silt samples reporting anomalous copper values ranging from 78 to 296 ppm occur downslope to the west of the mineralized float noted on the hill top. Silt samples D 450, D 451 and E 372, reported copper values ranging from 106 to 296 ppm and were collected from 1,200 to 1,600 feet west and downslope from the hill-top mineralization. Samples D 433 and D 434, assayed 80 and 78 ppm copper respectively and occur almost at the base of the western flank of this hillside. Significant but under threshold copper values in the 34 to 40 ppm copper range occur 600 to 1,200 feet further north along this same western flank of the hill (Claim 18).

A single anomalous copper value of 52 ppm was reported by sample E 363 (Claim 42), collected approximately half way down the eastern flank of the hillside and approximately 600 feet north of the hilltop site of mineralized float. Samples collected down-slope to the south (Claim 41) of FR 33 (copper-bearing float) and down-slope directly to the east (Claim 42), reported copper values of background level or less.

The second occurrence of copper-bearing float from the northern portion of the claim group occurs at the extreme northern end of the elongated carbonate ridge (Claims 51 and 52). Small pieces of malachite and azurite-stained float were picked up along a 400-foot long north-south extending zone to the west and north of a narrow linear outcrop of fractured limestone. Float sample FR 28 is representative fo this copper-bearing float from the north end of the carbonate ridge. Soil sample F 299, collected approximately 150 feet south of FR 28, reported 320 ppm copper. Two silt samples E 381 and F 314, collected 500 to 600 feet west and south of FR 28, reported anomalous but not extremely high copper values of 68 and 55 ppm respectively. Soil sample F 310 (104 ppm copper) was collected 2/3 way up the north flank of the hillside below peak 4, 016'. This anomalous copper value (2x threshold value) occurs approximately 1, 200 feet south of and upslope from the nearest reported copper float.

The distribution of anomalous lead-zinc values outlined by silt samples collected along the twin-peaked, carbonate ridge at the north half of the claim group closely reflects to the two clusters of anomalous copper values just discussed.

Silt sample F 378 from the vicinity of the southern copper-float location of FR 233 (Claim 41) reported extremely high trace element values of 2, 850 ppm lead and 13, 300 ppm zinc. An anomalous zinc value of 297 ppm (sample E 364) occurs 900 feet down-slope and directly east of the highly anomalous hilltop location. Silt samples E 362 and D 423 from locations 400 to 1, 000 feet further north along this same east flank reported significant but not anomalous zinc values of 214 and 234 ppm respectively.

The southern flank of the same ridge area (peak 4, 087') does not reflect the 13, 300 ppm zinc value reported by silt sample F 378 at the top of the ridge. Samples F 379, E 391 and F 380 (Claim 41), collected 300 to 600 feet downslope and to the south of the 13, 300 ppm sample location, only report in the 121 and 181 ppm zinc range. Silt sample E 367, collected almost at the base of this southern slope and near the east-west draining stream that breaches the carbonate ridge, reported an anomalous zinc value of 392 ppm. Sample E 368, collected 250 feet to the east, only assayed 121 ppm zinc.

The western flank (Claims 16, 18 and 43) below the anomalous ridge top is even more erratic in zinc values than the southern slope. Samples D 450 and D 451, approximately 1,000 feet downslope, reported slightly above background zinc values of 116 and 103 ppm respectively. Silt sample E 373 collected 400 feet further northwest and down-slope, reported a 2x background value of 182 ppm zinc. Other zinc values along this western slope, (Claims 16 and 18) range from a below background 70 ppm to a moderate 135 ppm zinc value.

The random distribution of zinc values along the slopes surrounding the mineralized sample location FR 33 and the nearby high zinc geochemical silt sample value of 13,300 ppm (F 378) do not reflect a well defined dispersion pattern. The widespread nature of anomalous zinc values does not suggest any definite alignment or zone of zinc mineralization occurring here. Perhaps the sample density is not sufficient to define favourable targets. The extremely anomalous geochemical sample F 378 represents an isolated zinc high associated with the malachite-stained float occurring nearby. This float sample (FR 33) assayed 4.78% copper as expected, but also assayed a surprising 15.93% zinc. Anomalous zinc samples E 367 and E 364 randomly distributed down-slope to the east and south may likewise reflect erratically spaced downslope float movement fanning out from this uphill source.

Lead values in the vicinity of silt sample F 378 (285 ppm lead) show a fairly distinct, but narrow dispersion pattern to the south of the hilltop location. Down-slope silt samples F 379, F 380 and E 368, reported anomalous lead values of 47, 67 and 50 ppm respectively. Sample D 450, 1,200 feet downslope to the west of the highly anomalous F 378 sample location, reported an anomalous 46 ppm lead.

Two silt samples collected at the extreme north end of the carbonate ridge, reported anomalous zinc values. Sample F 299, taken 150 feet south of the northernmost reported showing of azurite-malachite float (Sample FR 28), reported 352 ppm zinc. Three other samples collected upslope to the south of F 314 reported significant zinc values ranging from 186 to 218 ppm. The farthest south sample (F 309) of the group is located 1,700 feet south and upslope from the mineralized float sample FR 28.

The middle sample of this threesome reported an anomalous 138 ppm lead, the only anomalous lead value reported at this extreme north end of the claim group.

Copper and zinc values define an elongated north-south zone extending from a point 600 to 800 feet north of peak 4,016' to the vicinity of the northernmost occurrence of copper-bearing float (sample FR 28). The highest geochemical values occur at the north end of this zone not far from the copper-bearing float sample FR 28. The up-slope trend of this zone is opposite in direction from a dispersion train or pattern. Additional mineralization is expected above the three copper-bearing float locations shown on Figure 25. The source of a geochemical anomaly usually must be sought at or above the up-stream cut-off.

Geochemical Grid - (South) - Two detailed geochemical soil-sample grids were laid out at the south end of the carbonate ridge. The southernmost of these two grids (see Figure 26) covers the mineralized knob area (Claims 31 and 33) and the northern grid system (Figure 27) parallels the northwesterly trending fault or shear zone. The much larger geophysical grid system (Figures 28 and 29) was laid out at a later date on a 100-foot spacing and unfortunately does not correspond station by station to the geochemical grids.

The collecting of geochemical soil samples along the southern of the two grid systems (see Figure 26) was a logical step after follow-up stream sediment sampling and fairly detailed prospecting had been conducted. Float containing malachite, azurite, as well as, suspected sphalerite and zinc carbonate or silicate had already been located at three or four places to the south of the siliceous knob

The purpose of establishing this soil sampling grid system was to aid in delineating the anomalous source of the mineralization as closely as possible before trenching. This soil sample grid was also to serve as a guide for potential target areas if diamond drilling was commenced at a later date.

A true residual soil has developed along this rather flat-topped bald area at the south end of the larger carbonate ridge. During the natural process of soil formation (residual soil areas) the weathering of mineralization generally results in a concentration of that metal in the soil formed over the deposit. Being a driftless area, this part of the Yukon Territory is one of the few areas in Northern Canada not affected by Pleistocene glaciation. A minor amount of mechanical movement has probably occurred along the gentle slopes in the immediate area of the grid system but the complications expected in areas of predominantly transported overburden did not have to be considered here.

Well developed A and B horizons do not occur on the Mink Claim Group but nevertheless, an effort was made to collect the soil samples from a uniform depth of approximately 6 to 8 inches. The overall dimensions of the southern geochemical grid is 1,350 feet north-south by 400 feet east-west. The sample lines were laid out at the Brunton compass bearing of N 24°W. Sample spacing at the north and south end of the grid system is 100 feet but 50 feet spacing was maintained along the critical central portion (see Figure 26). The scarcity of good sample material due to accumulation of angular rock debris in certain portions of the geochemical grid made it necessary to deviate slightly from the 50 foot spacing. (Note uneven sample distribution along east-west lines directly north of central rock outcrop).

The distribution of anomalous zinc values along the southern grid system is defined by five groupings of samples reporting in the 8,000 to 17,650 ppm range and a fairly uniform plateau of anomalous zinc values in the 4,000 to 7,700 ppm range at the south end of the grid. An abrupt termination of anomalous values (above 270 ppm zinc) occurs along the northwest portion of the grid system and three or four tongues of background range values extend part way across portions of the middle and southern half of the grid.

The highest zinc geochemical value reported occurs near the west end of the fifth line from the south end. Sample E 103 reports 17,650 ppm zinc with two additional soil samples directly to the south reporting 12,000 and 9,700 ppm zinc. This high valued grouping of samples occurs at the northwest end of the anomalous southern geochemical plateau mentioned earlier.

An alignment of three areas of high zinc values extends for 400 feet south from the centrally located knob or siliceous outcrop. The northernmost of these groupings occurs immediately south of the outcrop and is represented by by sample D 156, reporting 8,350 ppm zinc. A group of samples surrounding this high value range from 1,320 to 4,000 ppm zinc. Directly to the northeast, a rather broad area of background-range zinc values establishes a distinct cut-off.

To the south, a low saddle-like zone of intermediate range anomalous zinc values (370-572 ppm) intervenes before the next high peak of 8,100 ppm zinc (Sample E 93) occurs. Zinc values in the 740 to 3,480 range surround this high.

Within 100 feet further to the south, the third highly anomalous zone of zinc values occurs. Samples D 173, E 101 and E 106 form this promising anomalous zone and report zinc values of 11,600, 13,500 and 10,000 ppm respectively. Mineralized float occurs just to the east of this area. A grab sample (FR 16) of suspected zinc carbonate or silicate material from this vicinity assayed 27.80% zinc. Directly to the south of this conspicuous geochemical high, an abrupt zinc cut-off occurs. Samples E 108 and D 179 represent this east-west trending geochemical low (zinc). The broad, anomalous plateau of high zinc values occurring at the southern end of the grid system lies directly south of this conspicuous low.

An elongated pattern of anomalous zinc values occurs at the northeast end of the grid system. Malachite-stained copper float was noted at two locations in the vicinity of this rather isolated area of anomalous zinc values, but no signs of sphalerite or zinc carbonates were found here. Soil sample D 136 reported a very respectable 8,300 ppm zinc value and D 137 occurring within 70 feet to the southwest, assayed 6,800 ppm zinc. Other anomalous values ranging from 950 to 3,700 ppm zinc define this rather large anomalous zinc pattern located north to northeast of the central rock knob. The well defined zinc cut-off mentioned earlier occurs directly to the west of this anomalous zone.

Anomalous copper zones are likewise fairly well distributed along the southern soil sample grid system. The general distribution and pattern defined by the anomalous copper samples closely parallels the zinc pattern described above. The copper anomalies are more confined and elongated in the north-south direction than the zinc anomalies, but nevertheless, closely resemble the previous distribution.

The broad plateau-like pattern of anomalous zinc values occurring at the south end of the grid system is modified into an elongated northern-trending zone of anomalous copper values (500 feet long). A geochemical peak of 2,200 ppm copper occurs along this zone (Sample E 103). This same sample reported the highest zinc value (17,650 ppm) occurring on the entire southern grid system. A large number of copper values in the 140 to 504 ppm range occur both to the north and south of this peak area represented by sample E 103. Definite copper cut-offs occur to the north, east and west of this trend which is still open to the south beyond the boundaries of the geochemical grid system.

The second most prominent zone of high copper values occurs approximately 150 feet east of the E 103 sample location with a narrow intervening saddle of below threshold values between. Sample E 101 and D 173 report copper values of 810 and 432 ppm respectively. A northerly trending group of anomalous copper samples ranging from 94 to 202 ppm copper surround these two extremely anomalous copper values. Malachite and azurite-stained float were collected from localities in the immediate vicinity of this anomalous copper pattern. A grab sample (FR 14) of this copper-stained material assayed 1.8% copper.

The next anomalous copper geochemical pattern occurs immediately south of the central knob or siliceous outcrop. This anomalous copper zone was to be expected in view of the in-situ occurrence of malachite, azurite and associated tiny blebs of chalcopyrite that occur at the southwest end of the central rock outcrop.(rock sample FR 15). Geochemical soil samples C 124 and D 156 from this vicinity reported 325 and 100 ppm copper respectively. Surrounding these high values, anomalous copper soil samples range from 48 to 82 ppm and form a small dispersion train or tail with a down-slope component to the east, as well as to the south.

The farthest north series of anomalous copper values from this southern geochemical grid system fan out along a 400 foot long north-south trending zone, roughly centered on sample D 137. This sample reported 334 ppm copper and once again was collected not far from reported occurrences of copper-bearing float. Surrounding copper values are in the 48 to 81 ppm copper range (threshold value 46 ppm copper), and define the extensive north-south trending pattern mentioned above.

The size and shape of the dispersion halos occurring on the southern grid system (Figure 26) hopefully reflect metal ions being leached from mantled zones of oxidation at the overburden-bedrock interface. Ideally, the copper and zinc ions have been carried upward from the mineralized zone below in the overburden and have been precipitated or absorbed by the silt-sized particles in the overburden. It is very likely, in the case of the geochemical grid area considered here, that mechanical erosion of mineralized material is equally responsible for the anomalous geochemical concentration patterns.

Some of the anomalous zones reflected by this geochemical grid certainly represent weathering of underlying mineralization and a concentration of that metal in the soil formed over the deposit. Even in this ideal geochemical situation there has been a certain amount of dispersion of anomalous material by ground-water discharging onto the surface, as well as the normal down-slope movement of surface runoff. Promising target areas might well occur at or above the point of cut-off and not always at the center of the anomalous zone.

Large portions of the southern geochemical grid system occur in an area of fairly flat uniform to moderately sloping surfaces. The central knob or rock outcrop is the high point of the area with a gradual slope away to the south and west. Even to the north, a low saddle-like depression occurs prior to beginning up a steep slope along the southern portion of the main limestone ridge. The most abrupt break in slope occurs along the eastern 1/3 of the grid system where the slope drops relatively steeply toward the wooded valley to the east of the knob. Possible dispersion patterns for both copper and zinc in the down-slope eastern direction are associated with sample locations D 173, D 156 and D 137 but these dispersion outlines are not especially pronounced or extensive. The long linear anomalous zinc and copper pattern south of the E 103, E 104 area near the southwest part of the grid system may reflect a dispersion pattern or dispersion train of a more widespread nature. The terrain slopes gently in this southerly direction toward the rock outcrop at the south end of the geochemical grid system. Numerous samples of zinc carbonate/silicate minerals were noted along this southwestern portion of the grid system.

The prime target areas established by this high density of soil samples occur 300 to 350 feet north of the south end of the southern grid system. The two distinct zones of highly anomalous combined zinc and copper values defined by soil samples E 103, E 104, D 176 on the west, and samples D 173, D 178, E 101 and E 105 to the east, rate as top priority zones. These favorable target areas should be investigated further by whatever future mineral exploration methods are used on the Mink Claim Group. The source of the mineralization may in both these areas lie north (upslope) from the high values themselves.

The trench excavated in the general vicinity of the western anomalous zone (see Figure 26) did not reach good exposures of bedrock but encountered several large pieces of mineralized float (zinc). The nearby prospect pit was completed before geochemical data became available and occurs in the less significant geochemical zone between two highs. Additional trenching (bull dozer) along the zone 20 to 80 feet north of the present trench might locate the buried source of the anomalous zone.

Other target areas established by this soil sampling network occur directly south of the siliceous outcrop near the center of the grid system. Fairly high combined copper and zinc geochemical values occur here. This anomaly could once again reflect a dispersion pattern due to the occurrence of disseminated copper mineralization to the southwest end of this outcrop. This submarginal zone of copper mineralization may project southward under the overburden or be confined to surface outcrop only. The general north-south alignment of this anomalous zone with other geochemical highs to the north and south could also reflect mineralization associated with the northwesterly trending fault and shear system mapped to the north.

The northernmost anomalous zone shows a geochemical peak 180 to 240 feet north of the central rock outcrop or knob. The presence of copper float in this vicinity coupled with the dual copper-zinc nature of this geochemical anomaly suggest a target area of some importance.

The broad zone or plateau of anomalous zinc values at the south end of the grid system is difficult to evaluate. No mineralization was located in place at the limestone outcrop in this general vicinity. The float samples of zinc occurring here could have all originated further north and in fact appear to form a mechanical dispersion train originating from that area. Sample C 78 (9,800 ppm zinc) is centered on the most attractive portion of this broader anomalous zone which is still open ended to the south. Additional geochemical sampling density, supplemented by an extension of the geochemical grid to the south would be useful to better evaluate this southern portion of the grid system. Soil and silt samples B 71 and B 70 (see Figure 25) collected 100 to 400 feet south and southeast of the grid system were not anomalous in either copper or zinc.

Several slightly anomalous geochemical values occur within the southern grid system. Only sample E 103, assaying 168 ppm zinc is significant and this sample location has already been discussed as a copper and zinc anomaly. Other lead values in the 40 to 62 ppm range define a spotty distribution pattern confined to the southern half of the grid system.

Geochemical Grid System - (North) - A second geochemical grid system (Figure 27) was established to the north of the main southern grid discussed above. This sampling grid extends 1,900 feet in a N 10°W bearing and varies from 300 feet in width at its north end to a narrow 100 feet at its south end. Sample spacing is at [illegible] foot intervals along this grid system which roughly parallels the break in slope and vegetation along the southeastern flank of the elongated carbonate ridge

A series of northwesterly trending shear zones and faults are mapped along this flank of the carbonate ridge. These zones of weakness offer excellent possibilities as structural control for mineralization. This grid system was established to better test and evaluate that possibility soon after malchite-stained float was noted at two fairly well separated locations along the lower slopes of this flank of the ridge (see Figure 27).

Anomalous zinc values occur as four fairly well-defined clusters along the north-south extent of this grid system. Near the north end, samples D 191, D 195 and D 205 assayed 1,032, 348, and 575 ppm zinc respectively. Several samples in the general vicinity reported significant but not anomalous zinc values in the 220 to 262 ppm range. Silt sample D 196, collected approximately 320 feet south of the extremely high valued sample D 191, assayed 420 ppm zinc.

The second anomalous zinc pattern occurs along the eastern half of the grid system near the midpoint of its north-south dimension. Sample E 127 from this locality, reported a 1,440 ppm zinc value and occurs 80 to 100 feet down-slope (to the east) of an area of reported copper-stained float. Up-slope to the west, samples D 198 and E 115, report 287 and 194 ppm zinc respectively. This up-slope cut-off direction is peculiar in regard to the position of the mineralized float. Likewise unexplained is the fact that copper geochemical values here are not anomalous even with copper float occurring nearby. This anomalous zinc pattern is open to the east.

The third area of anomalous zinc values is the least impressive of the four and occurs at the south end of the wider northern portion of the grid system. Samples E 126 and E 114 reported zinc values of 296 and 354 ppm respectively. As at the north end of the grid system, several significant but under threshold level zinc values in the 200 to 262 ppm range define a fairly broad but weak dispersion pattern south of these samples.

The fourth and sourthern-most anomalous zinc zone is defined by three peaks of anomalous zinc values distributed along a 400-foot long north-south zone at the eastern (downslope) edge of the narrow handle-like portion of the grid system. Sample E 111, at the center of narrow linear trend, reported 1620 ppm zinc. Samples E 112, to the north and D 182 to the south, assayed 355 and 456 ppm zinc respectively. A definite geochemical cut-off occurs upslope (to the west). Lower but still significant zinc values occur between these anomalous peaks but the anomaly as a whole is still open to the east.

Anomalous lead zones occur in the same vicinity as the first three of the previous areas of high zinc values. The southern-most elongated zinc anomaly discussed directly above is not repeated as an anomalous lead trend.

A rather broad zone of anomalous lead values occurs at the north end of this grid system. This anomaly trends generally north-south and exhibits twin peaks of very anomalous lead values. Samples E 132 and D 193, reporting 179 and 278 ppm lead respectively, occur at the extreme northwestern end of the grid system and define one of these geochemical peaks which is still open ended to the north and west. The second peak occurs along a zone 200 to 300 feet south of D 193. Samples D 191 and E 119 associated with this geochemical high, reported anomalous lead values of 161 and 196 ppm. A fairly broad pattern of anomalous lead values in the 41 to 85 ppm range surround these highly anomalous peaks. A samples E 121 and D 196 define an elongate southern lobe or disp[illegible] ing still another 250-feet to the south. Fairly abrupt geochemical [illegible] upslope (to the west) and within the grid system toward the south.

The second major area of anomalous lead values close[illegible] to the second zinc zone and occurs near the center of the grid sys[illegible] of the reported copper-stained float. Soil samples E 127 and D 1[illegible] vicinity, report 54 and 75 ppm lead respectively and outline an el[illegible] slope trend.

The third anomalous lead zone is lower in magnitude t[illegible] This weak indication of lead dispersion parallels the second an[illegible] only a short distance (approximately 200 feet) to the south. A[illegible] were also reported from this third locality. Samples E 11[illegible] an[illegible] 40 and 49 ppm lead respectively, outline this weak anomaly w[illegible] in the down-slope eastern direction.

Geochemical results from this northern grid sy[illegible] anomalous copper zone corresponding with the northern [illegible] reported lead and zinc anomalies. Malachite-stained fl[illegible] 40 feet below (east of) soil sample D 191. An anomal[illegible] was reported by sample D 191 followed by an ext[illegible] copper (soil sample D 195) 100 feet further east (d[illegible] copper anomaly defined here is much more confined [illegible] anomalous lead and zinc geochemical patterns [illegible] vicinity. Copper cut-offs occur in all directio[illegible]

The complete absence of a copper geochemical anomaly associated with the area of reported copper float occurring 900 feet south of the north end of the grid system has already been mentioned. Geochemically anomalous lead and zinc values occur in the vicinity of soil samples D 198 and E 127 but the copper-bearing float discovered here is not reflected by the soil geochemistry.

In summary, the four anomalous zones of lead and zinc defined by the northern geochemical grid system could reflect north-south oriented zones of mineralization paralleling the series of fault and shear zones known to occur here. Each of the anomalous zones reflects a well-defined, eastern trend in the down-slope direction. This perpendicularity of the geochemical pattern to the orientation of suspected northern trending zones of possible mineralization is most likely a reflection of down-slope dispersion of the metal ions. Only at the north end of the grid system does the anomalous lead distribution pattern show a definite north-south component more in keeping with the suspected structural control. Nevertheless, the four anomalous lead-zinc zones, considered as a unit, fit well into the north-south structurally controlled trend of suspected mineralization. Either intermittent bedrock highs in the overburden or a pinching out and narrowing of the possible mineralized source of these geochemical highs could account for the spotty nature of anomalous zones along this north-south trending grid system.

Anomalous lead values are of a considerably higher range and far more widespread along the northern geochemical grid system than at the southern one. These high lead values are likewise reflected by soil and stream sediment samples collected along the entire southeastern flank of the central carbonate ridge.

The prime target area established by the northern grid system occurs at the highly anomalous north end of the grid and reports anomalous values in copper, lead and zinc. The open ended nature of anomalous geochemical values at this end of the grid system emphasizes the need for additional soil samples in this area. (terrain conditions permitting).

Prospecting Results

The prospecting operations closely parallel the geochemical sampling conducted on the Mink Claim Group. The areas prospected in increasing order of importance are: 1) the low priority Mesozoic terrain partially covered by the claim group, 2) the entire northwest-trending Permo-Pennsylvanian-age carbonate ridge, and 3) the relatively small area surrounding the mineralized siliceous knob occurring directly south of the Paleozoic core or ridge.

Rock samples were collected at several locations and mainly represent mineralized float or suspected signs of mineralization. Only one rock sample (FR 15) was collected from an in-situ location. All others represent mineralized float material collected from the claim group. The area as a whole is heavily mantled by talus along the steeper slopes and frost-heaved rock debris is common in the lower areas. Large areas of valley-bottom alluvium (see Figure 25) surround the resistant central limestone ridge. One of the main prospecting tools used by the geologists and assistants was the careful examination of rock debris for signs of mineralized float.

No evidence of mineralization was encountered while prospecting in the areas underlain by Lower Cretaceous sandstones and shales although well over half the claims making up the Mink Group occur in areas of Mesozoic terrain. Special emphasis was devoted to Cretaceous age outcrops in claims 27 to 32. This portion of the claim group is on strike with the northwestern trending fault and shear zones that occur along the southeastern flank of the carbonate ridge and in addition, is directly south of the known mineralization occurring in the vicinity of the siliceous knob. The dark shales and silty sandstones of the Husky Formation outcropping sporadically in this vicinity did not appear encouraging from a host rock or age standpoint.

In addition with the copper mineralization associated with the siliceous knob, five occurrences of copper-bearing float were encountered at widely separated localities along the central limestone ridge of Permo-Pennsylvanian age (see Figure 25) extending from the extreme northern end of the ridge to the southeastern flank of the southern-most hill. In each case badly shattered and weathered malachite and azurite-stained material was noted. This float appears to represent an original source area of mineralization related to fracture filling but as no mineralized outcrop of the material was located this is really only speculation.

At the extreme northern end of the carbonate ridge, several widely scattered pieces of malachite and azurite-stained float were noted just to the north and northwest of a prominent linear outcrop of limestone. This linear trend of limestone was carefully examined for evidence of slickensides or other signs of fault control with negative results. A grab sample of the nearby mineralized float (sample FR 28) assayed only 0.85% copper. A check assay of the same pulp by Loring Laboratories reported a slightly higher 0.96% copper. Binocular microscope examination of this material revealed a greyish-brown limestone with calcite fracture fillings. Small stained areas of malachite and azurite with some reddish brown hematite appear to be genetically related to the calcite filled fractures.

Anomalous geochemical results occur at this northern most area of mineralized float and are discussed in detail earlier in the report.

The second most impressive occurrence of mineralized float occurs at the north end of claim 41 just to the south of peak 4,087'. Highly siliceous malachite-stained material is scattered over a 30 to 40-foot area. Rock sample FR 33 of this mineralized float assayed 4,78% copper, 0 76% lead and 15.93% zinc. Binocular microscope examination of similar material again suggests a fracture filling mode of occurrence. Crystalline quartz linings and porous leached siliceous zones were noted. Botryoidal azurite and malachite stain occur along fracture planes and in vugs. Weak indications of galena and small blebs of red-brown sphalerite were also noted. A very strong but localized geochemical anomaly reporting copper lead and zinc occurs in the vicinity of sample FR 33. The geochemical aspects of this locality are discussed earlier in the report. The ridge top location of this float sample suggests a nearby source area.

A third occurrence of mineralized float was noted along the southwestern flank of the southern hill (3,929') of the Paleozoic age limestone ridge. Traces of malachite-stained float were noted on claim 10 along the heavily mantled western flank of the hill (see Figure 25). Geochemical silt sample C 317 from this general vicinity reported anomalous in copper. The float material probably originated higher up the slope to the east but examination of outcrops along the slope and on the ridge top failed to reveal the source of the mineralization.

The fourth and fifth areas of reported copper-stained float both occur along the opposite or southeastern flank of this same hill (3,929') and are located within the boundaries of the northern geochemical grid system (see Figure 27) discussed earlier in the report. Float sample BR 7 from the north end of this grid consisted of calcite vein material with malachite and azurite staining and assayed 1.80% copper. Numerous fragments of copper-stained material were noted approximately 750 feet further south (see Figure 27) but a sample was not collected. This hillside is heavily mantled and the float could easily have originated from much further up slope. Nevertheless, geochemical and geological evidence strongly point toward a structurally controlled local source for this mineralized float. Angular pieces of chert pebble conglomerate occur as the predominant rock type along the lower portion of this hillside and suggest a downthrown block of Permian-age Jungle Creek Formation probably occurs here. Up slope, cherty Permo-Pennsylvanian limestones of the Ettrain Formation occur as outcrops and angular talus debris. Good evidence of several northwesterly trending shear and fault zones occurs along this southeastern flank of the main carbonate ridge. Structural control for localized fracture filling or even vein-type mineralization is present along this northwestern trending zone.

Prospecting in the vicinity of the siliceous knob centered along the flat-topped clearing at the southern end of the limestone ridge revealed the most attractive and widespread signs of mineralization encountered on the entire claim group. Inexco Mining Company personnel had located copper and zinc float in this vicinity at an earlier date. Claims 31 and 33 cover this critical portion of the Mink Claim Group.

Figure 26 shows the location of all rock samples collected from this moderately to heavily mantled portion of the claim group. The gentle terrain sloping away from this siliceous outcrop was ideal for prospecting operations but once again float was the main evidence for the presence of mineralization in the area.

Malachite-stained float was first encountered 300 to 400 feet south-southeast of the central siliceous knob or outcrop (see Figure 26). Rock sample FR 14 represents this material and assayed 1.84% copper and 13.32% zinc. Microscopic examination of this material showed botryoidal coatings of malachite in vugs and cavities as well as, distinct grains of the same mineral within the rocks. The country rock consists of siliceous material with a porous, leached appearance. A significant amount of red-brown sphalerite occurring as blebs up to 1-1/2 inches in diameter were noted in sample FR 14 and chalcopyrite cores were often visible within the blebs of sphalerite. The genesis of these copper and zinc sulphides appears closely related in both time and mode of occurrence and microscopic examination suggests that they precipitated out of solution contemperanously or at least from the same parent hydrothermal solution. The red-brown sphalerite weathers to a soft honey-brown crust or stain. Portions of this sample contain masses of vuggy, porous bone white material resembling smithsonite or calamine.

Float sample FR 16, collected 60 feet further north and slightly up-slope from FR 14, consists of a bone-white mass of porous box-work or lattice material with a very high specific gravity. Botryoidal crustations associated with this sample appear to be calamine while the slightly orange tinted to bone-white portions are probably smithsonite (?). This sample assayed 27.80% zinc but only 480 ppm copper. Lead reported a negligible 24 ppm.

Malachite-stained float with specks of sphalerite were traced up-slope to the north and aided in locating the only in-situ showing of mineralization noted on the entire Mink Claim Group. Sample FR 15 represents malachite and

and azurite-stained material occurring at the southwest corner of the siliceous knob. The bedrock here consists of a steeply dipping, highly brecciated, material that has been largely replaced by introduced silica. This outcrop may well represent a more resistant portion of one of the northwestern trending shear zones noted to the north. Portions of the knob-like outcrop certainly represent the original rock that forms the central core of the Mink Anticline but very little evidence of original carbonates (Ettrain Formation) or bedding is visible.

Grab sample FR 15 representing some of the better mineralization from this outcrop assayed 2.48% copper. Chip samples were not taken across the entire 15 to 20 foot zone of mineralized outcrop but the widely disseminated nature of this occurrence would have resulted in a low average copper assay. The vuggy openings along the siliceous outcrop were lined with quartz crystals and weak indications of azurite and malachite. The highly disseminated copper mineralization consists of fracture coatings along seams and thin malachite films and blebs within the open voids. Lean to completely barren zones were common even within the better mineralized portions of the outcrop but copper mineralization gradually diminished to the east and completely faded out at the southeastern end of the outcrop. The northern portions of this siliceous outcrop were completely barren of mineralization and the showing at the southwestern corner would have to be considered submarginal in grade.

Several samples of a heavy white porous mineral were collected in the vicinity of the rock outcrop at the south end of the geochemical grid system (south) and are shown as zinc float locations on Figure 26. This material with a heavy specific gravity was traced along a belt 250 feet northward from this outcrop. A large boulder of this material occurs in the vicinity of the trench (Figure 26). This material is similar in most respects to sample FR 16 described earlier. Sample AR 14 representing a pure mass of this heavy bone-white mineral, assayed 47.80% zinc by AA methods. An assay check by Loring Laboratory of the same material reported 46.41% zinc verifying the presence of a secondary zinc carbonate or silicate mineral. The material collected does not effervese in cold dilute HCl but nevertheless, has the appearance of dry bone ore (white porous smithsonite). A mixture of smithsonite (zinc carbonate) and calmine (hydrous zinc silicate) probably accounts for the lack of effervesence in this material. The mineral consists of botryoidal crusts as well as fibrous honey-combed masses and networks. Color varies from bone-white to dull yellowish-brown with delicate shades of green occurring on some samples. The material is brittle with a sub-pearly luster, a hardness of 5 and an estimated specific gravity of well over 3.

The trench excavated in the vicinity of geochemical silt samples D 176 and E 105 is located at the approximate northern extent of this float zone of secondary zinc minerals and was placed here to test for mineralized outcrop below the overburden. The details of this excavation are discussed later on in this report.

The first question that comes to mind when considering the abundance of zinc carbonate-silicate float occurring near the south end of the Mink Claim Group is the possibility of and depth to unaltered sphalerite mineralization. Although minor traces of sphalerite were noted in several of the float samples collected here, these usually occur as weakly mineralized fracture coatings or tiny disseminated blebs scattered through the highly altered rocks. The widespread occurrences of massive dry bone-type zinc mineralization in the area suggests that thicker zones or veins of sphalerite may have occurred here or are still present below the weathered surface. The secondary zinc minerals could have resulted from secondary enrichment of submarginal disseminated sphalerite mineralization occurring along fissures in the earlier landscape. The absence of Pleistocene glaciation in this part of the Yukon could account for such secondary processes usually more typical of drier climates. Certainly the weathered zone at the south end of the carbonate ridge is not to be compared with the deep zones of leaching and secondary enrichment occurring in the southwestern United States. The primary source of smithsonite-calamine is not to be expected at a great depth and hopefully has not already been weathered away.

Geophysical Surveys

The prospecting and geochemical field work indicated that ground geophysics could best be employed in the relatively flat area surrounding the siliceous knob (see Figures 28 and 29). The location was ideal for such surveys considering the presence of copper and zinc mineralization along the projected extension of shear and fault zones. The presence of abundant mineralized float with possible structural control presented logical targets for this geophysical survey.

A geophysical grid was laid out with a 2,000 foot long baseline oriented N 20° W and parallel with a line roughly bisecting the structural trend of the anticline (N 30° W) and the structural projection of the fault zones (N10° W) mapped further north (see Figure 25). The grid network was chained and picketed at 100 foot intervals with cross lines extending 800 feet to the east and west of the baseline. A total of 35,600 feet of line was laid out and 357 stations were established. The zero line is at the south end of the grid system and was 100 feet south of the southern-most reported occurrence of mineralized float.

Magnetometer Survey - A magnetometer survey was conducted over the geophysical grid and corrected results in gammas are shown on Figure 29. A McPhar M 700 magnetometer (a vertical field flux gate magentometer) was utilized in the survey. The magnetometer was calibrated to give only positive readings. The base line was read in a period of 20 minutes to minimize diurnal variation and these readings served as standards by which all subsequent readings on cross lines were corrected for diurnal variation.

The M 700 magnetometer is a high-order precision instrument with an accuracy of ± 5 gammas on the most sensitive range (1,000 gammas full scale deflection). Built-in latitude adjustment permits cancelling the earth's field up to a magnitude of ± 100,000 gammas. Temperature drift is less than 50 gammas under Canadian operating conditions (-35° to + 55° C).

The survey was conducted by a continuous time regulated reading of stations along cross lines. Stations coincident with cross-lines and the baseline provided readings which were compared with the previously established baseline and standard diurnal variation was calculated. Using this system a correction for diurnal variation was possible every 18 minutes and intervening readings were corrected accordingly. In summary, the field results have been corrected for time and diurnal magnetic variations before plotting them on Figure 29.

Diurnal variance between adjacent baseline stations as recorded during the survey ranged from 10 gammas to 140 gammas. The corrected readings range from a minimum of 560 gammas to a maximum of 945 gammas.

The values were contoured at a 50 gamma interval. The resultant pattern shows only a possible correlation with the geochemical survey and none with the EM survey. The location of the geochemical soil sampling survey is shown in reference to the geophysical grid layout by the superimposed dotted line (see Figure 29). Figure 26 representing the geochemical soil sample grid plan, is at a scale of 1 inch to 50 feet and the magnetometer geophysical survey plan (Figure 29) is at a scale of 1 inch to 100 feet.

The high reading of 885 gammas reported by the first station east (100 feet) of the baseline on cross-line 6 occurs at the western end of an elongated east-west trending pattern defined by the 750 gamma contour line. This magnetic high (relative) occurs just north of sample E 93 which reported 220 ppm copper and 8, 100 ppm zinc. This soil sample is in line with the three zinc geochemical highs that parallel the projected north-south structural trend of the fault and shear zones occurring further north.

A magnetic high of 945 gammas occurs 100 feet west on cross-line 0. This high corresponds with the southwestern edge of the high plateau of copper and zinc geochemical values that occur at the south end of the geochemical grid system. (Figure 26). Magnetic highs of 860 and 870 gammas occur near the east end of lines 14 N and 9 N respectively. The 800 and 850 gamma contour lines define a slightly elongated north trending pattern that could reflect structural control along this extreme eastern end of the geophysical grid system.

Several east-west trends of lesser magnitude are indicated on the contoured magnetometer survey plan (Figure 29). These trends are defined by the 750 gamma contour with the magnetic peaks mentioned previously occuring at specific points along the larger trend. The east-west oriented trends may reflect cross tensional fractures occurring near the apex of the Mink Anticline, however, their significance is uncertain.

Zinc carbonates, silicates and even sphalerite do not respond well to magnetometer surveys. The weathered zinc float at the surface may represent the upper limit of a deeper lying sulphide zone which may be detectable. Magnetite and pyrrhotite were not observed in the mineralized float samples but could be present in association with the copper sulfides known to occur here or could be present as gangue minerals along the suspected north-south trending fault and shear zones.

Electromagnetic Survey - A McPhar 1000/5000 vertical loop electromagnetic unit (Model SS15) was used to conduct an EM survey over the same grid system. This model can be used effectively over a transmitter-receiver distance of 2,000 feet - however, for increased accuracy of readings, four transmitter locations were utilized which resulted in a maximum transmitter-receiver distance of 1,050 feet. Readings were taken at both 1,000 and 5,000 cycles per second settings at 100 foot intervals along the cross lines. Transmitter direction and receiver location were coordinated by means of a time schedule. Depth penetration of this instrument is roughly half of transmitter receiver distance.

No really consistant pattern of inflection points or crossover points is revealed in this survey. The dual-frequency crossovers on lines 7N and 9N east of the baseline are suspected of occurring over shallow overburden (proximity to knob-like outcrop). The low readings associated with the crossovers in line 7N are probably due to overburden conduction effects. The crossover on line 9N could represent a conductor located approximately 150 feet east of the baseline. This dual frequency crossover is reflected by sizeable dip angle variations on both the

1,000 and 5,000 cps frequencies.

This lone crossover could not represent a very persistent conductor as only an inflection point occurs on line 8N to the south and no EM effects are reported north of this station.

The EM survey results are regarded as inconclusive and do not appear to have aided in the search for extensions of north-south trending structures. Massive sulphides are the most feasible target for EM surveys. Zinc carbonates and silicates and even massive sphalerite do not normally respond well to EM techniques. Likewise, the copper sulphides occurring on the Mink Claim Group may be too widely disseminated for effective detection by EM surveys. The low valued sporadic conduction suggested on Figure 28 may be due to overburden effects.

Trenching

The most promising locality south of the siliceous knob was selected for trenching (see Figure 26). The northern limit of abundant zinc bearing float was located in the vicinity of a massive boulder of zinc carbonate roughly 3 feet in diameter and 8 feet long.

The trench site was established nearby. This excavation is located 500 feet south-southwest of the prominent siliceous knob and is shown on Figures 26, 28 and 29. From a geochemical standpoint, the trench was located immediately south of soil sample D 176 which reported 504 ppm copper and 9,700 ppm zinc. The purpose of this trenching was an effort to reach bedrock (possibly mineralized) below the overburden. The selected site was also over a slight hump in the generally featureless terrain and hopefully represented a bedrock high.

Three test pits 3 to 4 feet deep were hand dug (25 feet apart) in an east-west alignment. In various stages, a total of 52 drill holes were put down between the test pits using an Atlas-Copco Cobra plugger drill. These holes varied from 2 feet to 6 feet in depth. The overburden encountered in the digging of the test pits and in the drilling was composed of small to large angular rock debris with a sticky clay matrix. Drill steel became jammed solid on numerous occasions and required much determination and ingenuity to be loosened.

The holes were loaded with 2 to 8 sticks of 40% forcite (CIL) and then primed and tamped. Electric detinators were placed on the second and forth stick in the deeper holes. Holes were connected in series and electrical blasting wire was strung 600 feet to safe cover. Early in the trenching operation, the charges were fired using two six volt batteries in series. The current was not sufficient and only three holes could be fired at a time. The 24 volt EM generator was substituted and provided sufficient current for the 10 to 15 hole setups. Early blasting efforts failed to clear the trench of overburden as planned and a staggered drill hole pattern with additional charges placed on the surface was used. This method was more effective in removing overburden cleanly and prevented the trench opening from being filled by broken rock and loose debris after the blast. A second type of explosive known as 70% CIL gel also proved superior for clearing the trench. Further excavation by pick and shovel was required along the entire 55 foot length of the trench and allowed the 4 to 4-1/2 foot deep blasted portion to be deepened to a total depth of five feet. Average width of the trench is 4 feet.

From the response of the drill it is believed that bedrock was encountered in some holes at a depth of five to 5-1/2 feet except in the eastern portion of the trench where suspected bedrock is deeper. Badly weathered and broken bedrock was partially exposed at the western end of the trench and is composed of fractured limestone and siliceous material. The base of the trench did not offer good enough exposures to examine this bedrock in any detail. Close examination of suspected bedrock brought to the surface by blasting was barren. Nevertheless, several pieces of overburden material dug out by hand from the lower 4 to 5 feet portion of the trench contained mineralization in the form of sphalerite and the zinc carbonate-silicate mixture.

Sample F 20 of similar material from near the bedrock surface is made up predominantly of a mixture of dark grey to light grey limestone or dolomite with numerou barren fracture fillings. Much of the material is highly brecciated. This sample was not assayed. A small test pit was excavated 60 feet northeast of the trench but failed to reach bedrock.

An effort was made to expose a fresh bedrock surface at the mineralized southwest corner of the siliceous knob or outcrop. Four holes were drilled to a depth of 4 feet on the mineralized portion of this outcrop. These holes were loaded with 19 sticks of 40% forcite and fired. The rock was very well fractured by the blast and exposed fresh bedrock at the desired location. This fresh surface was void of any signs of visible mineralization. Minor traces and weak indications of malachite and azurite were observed in the broken rock debris created by the blast. It appears that the lean zones of mineralization found on the surface of the outcrop had very little extent or significance. It also was evident that the entire mineralized portion of this exposure was removed by the blast.

A total of 19 man-days were required in the drilling, blasting and trenching operations near the south end of the Mink Claim Group. The blasting operations utilized 213 sticks of 40% forcite (CIL) and 120 sticks of 70% CIL gel. These explosives were supplied by Inexco Mining Company. The results of this trenching operation were not very encouraging from the standpoint of the ability of the dynamite to remove overburden cleanly and expose fresh bedrock surfaces below. The combination of deeper than expected overburden which absorbs shock readily and the low grade forcite (only 40 percent) did not clean the trench but did bring some bedrock to the surface. Roughly 1/4 of the man-days utilized on the trench involved hand excavation and removal of broken rock debris not cleared by the blasting operations. The presence of zinc-bearing float and mineralized rock particles occurring well below the overburden surface were encouraging. Bedrock appears to be closer to the surface at the western end of the trench. The small prospect pit north of the trench site indicates the presence of deeper overburden in this direction as material hand dug to a depth of almost five feet did not reveal the bedrock surface.

Conclusions

The mineralized portions of the Mink Claim Group are underlain by Permo-Pennsylvanian carbonates occurring along the axial core of the larger Mink Anticline. Five widely scattered occurrences of malachite and azurite-stained float with lesser amounts of sphalerite were noted along the northwesterly oriented limestone ridge. Two of these occurrences were noted north of the water gap that bisects this central ridge into north and south segments. The other three locations occur along the flanks of the elongated rounded hill that forms the southern portion of the ridge.

In addition to these occurrences, a rather extensive area of abundant mineralized float containing malachite, azurite, sphalerite and a mixture of zinc carbonates and silicates occurs in the vicinity of the siliceous knob immediately south of the limestone ridge. This area offers a strong possibility of structurally controlled mineralization along the southern projection of the north-south trending fault and shear zones mapped further to the north.

Detailed geochemical surveys covering the entire length of the three mile long carbonate ridge suggest several areas of possible copper-zinc mineralization. Float samples suggest a disseminated fracture filling variety of mineralization. A very extensive geochemical pattern of anomalous lead values occurs along the southwestern flank of this ridge.

Two detailed soil-sample grids further outline several potential zones of copper and zinc mineralization in the vicinity of the siliceous knob to the south of the ridge and along the southeastern flank of this same ridge.

Fairly extensive magnetometer and electro-magnetic surveys were conducted at the south end of the claim group in the vicinity of the siliceous knob, but the results are regarded as inclusive.

Trenching along a selected zone in this same southern area did not reach good exposure of bedrock and is likewise inconclusive.

Extensive bulldozer trenching followed by a diamond drilling program of moderate scope is recommended at this south end of the claim group. The target areas for this work would be based mainly on presently available geochemical soil sample results. An IP survey covering of this area might also prove useful in further defining the suspected zones of disseminated copper sulphide. If massive zinc sulphide veins occur here as may be indicated by the extensive signs of secondary zinc minerals on the weathered surface, geophysics may not be useful in defining the zones at all.

Additional soil sampling, prospecting and trenching could also be conducted further north along the carbonate ridge at the sites of copper-bearing float and coinciding geochemical anomalies. Priorities of these locations are: 1) the anomalous southeastern flank, 2) the geochemically anomalous northern end of the ridge, and 3) the (4,087') peak at the south end of the northern segment of carbonate ridge.

GEOLOGIC MAP AND CLAIM LOCATION MAP

MINK CLAIM GROUP

DAWSON MINING DISTRICT

OGILVIE MOUNTAINS PROJECT AREA

YUKON TERRITORY

PREPARED FOR

INEXCO MINING COMPANY

GEOPHOTO SERVICES LTD
CALGARY ALBERTA CANADA

A SUBSIDIARY OF
TEXAS INSTRUMENTS INCORPORATED

SCALE
1 inch = 2000 feet
2000 1000 0 2000 4000

NOVEMBER 1973

LEGEND

GEOLOGIC MAP UNITS

QUATERNARY	Q	Surficial deposits (unconsolidated)
TERTIARY		
UPPER CRETACEOUS	Ku	Sandstone, minor shale
LOWER CRETACEOUS	Ka	Mainly shales with upper conglomerate layer
	Kg	GOODENOUGH FORMATION Mainly shale, includes some sandstone
	Kmc	MARTIN CREEK FORMATION Mainly orthoquartzite and sandstone
	Kh	HUSKY FORMATION Mainly shale
JURASSIC		
UPPER TRIASSIC	Ŧ	SHUBLIK FM equivalent Shale, siltstone, limestone
PERMIAN	Pt	TAHKANDIT FORMATION Mainly chert, limestone
	Pjc	JUNGLE CREEK FORMATION Shale, limestone, conglomerate
PERMO-PENNSYLVANIAN	Pe	ETTRAIN FORMATION Mainly cherty limestone

NOTE: Where map unit includes two formations, dominant unit determines color code used
Geology based on 1972 Inexco mapping with minor revisions and additions by Geophoto. Claim boundaries based on diagram supplied by Inexco Mining Company.

GEOLOGIC SYMBOLS

- 25 Strike and dip of bedding measured by field traverses 1969-73
- 70 Overturned bedding
- Photogeologically estimated attitude of beds:
  - Horizontal
  - Dip less than 3°
  - Dip 3° to 10°
  - Dip 11° to 26°
  - Dip 26° to 45°
  - Dip more than 45°
  - Vertical
- Jointing-vertical
- 70 Jointing-Dipping
- Formational contact - dashed where approximate
- SB —— SB Stratigraphic break
- SB₂ —CONGL— SB₂ Marker bed
- Anticline - Crest line of anticline showing apex and plunge of axis
- Syncline - Crest line of syncline showing plunge of axis
- U Fault or Lineament - dashed where indefinite, dotted where concealed, U denotes upthrown side
- Thrust Fault - triangles on overthrust plate
- Identifies isolated segment with labelled area

PHYSICAL FEATURES

- x 3362' Spot elevation
- River
- Stream

Figure 25

LEGEND

GEOCHEMICAL STREAM SEDIMENT AND SOIL SAMPLES

°A116-20-35-202 — Sample location and number (1973 Field Program) followed by hot extraction analysis values for copper, lead and zinc respectively in ppm. (A to F prefixes denote sampler).

°R395-16-85-300 — R prefix designates 1969 reconnaissance samples. AA hot extraction analysis sequence as above (x denotes less than 10 ppm).

NOTE: 1969 lead values are considerably higher than 1973 lead values due to calcium interference during AA analysis. This analytical problem has since been corrected. Compare lead values on relative basis only.

ROCK SAMPLES

°AR6 — Sample location and number. Second letter R, signifies rock sample (A to F prefixes denote sampler). Assay values do not appear on maps (see report for Geophoto AA and Loring Laboratory assay results).

PHYSICAL FEATURES

x 3362' — Spot elevation from 1" = 2,000' topographic maps

River, Stream — Drainage features taken from 1" = 2,000' topographic maps where available and otherwise from air photo enlargements

GEOLOGIC SYMBOLS

- Strike and dip of bedding measured by field traverses 1969-73
- Overturned bedding
- Horizontal; Dip less than 3°; Dip 3° to 10°; Dip 11° to 26°; Dip 26° to 45°; Dip more than 45°; Vertical — Photogeologically estimated attitude of beds
- Jointing-vertical
- Jointing-Dipping
- Formational contact - dashed where approximate
- SB——SB Stratigraphic break
- SB3-CONGL—SB3 Marker bed
- Anticline - Crest line of anticline showing apex and plunge of axis
- Syncline - Crest line of syncline showing plunge of axis
- Fault or Lineament - dashed where indefinite, dotted where concealed, U denotes upthrown side
- Thrust Fault - triangles on overthrust plate
- Identifies isolated segment with labelled area
- Rock outcrop in heavily mantled or talus covered area
- Gossan zone or Fe oxide seepage zone
- Cu Float — Mineralized float

NOTE: Contour base map produced by photoenlargement of 1 inch = 2,000 feet topographic map. Scale should be considered as approximate.

NOTE: Claim boundaries and tag numbers based on diagram supplied by Inexco Mining Company.

GEOLOGIC MAP UNITS

Age	Unit	Description
QUATERNARY	Q	Surficial deposits (unconsolidated)
TERTIARY		
UPPER CRETACEOUS	Ku	Sandstone, minor shale
LOWER CRETACEOUS	Ka	Mainly shales with upper conglomerate layer
	Kg	GOODENOUGH FORMATION Mainly shale, includes some sandstone
	Kmc	MARTIN CREEK FORMATION Mainly orthoquartzite and sandstone
	Kh	HUSKY FORMATION Mainly shale
JURASSIC		
UPPER TRIASSIC	Tr	SHUBLIK FM equivalent Shale, siltstone, limestone
PERMIAN	Pt	TAHKANDIT FORMATION Mainly chert, limestone
	Pjc	JUNGLE CREEK FORMATION Shale, limestone, conglomerate
PERMO-PENNSYLVANIAN	Pe	ETTRAIN FORMATION Mainly cherty limestone
MISSISSIPPIAN	Mhr	HART RIVER FORMATION Shale, siltstone, minor limestone
UPPER DEVONIAN	Du	Black siliceous shale and chert; also includes conglomerate and sandstone to north
MIDDLE DEVONIAN	Do	OGILVIE FORMATION Mainly limestone, some reefoid horizons
MIDDLE & LOWER DEVONIAN	Dg	GOSSAGE FORMATION Mainly dolomite, some limestone
SILURIAN ORDOVICIAN	OSrr	ROAD RIVER FORMATION Mainly graptolitic shale, some limestone
ORDOVICIAN CAMBRIAN	€O	Limestone and dolomite
PRECAMBRIAN	p€	TINDIR GROUP Carbonates, shale, sandstone

Dpc — PRONGS CREEK FORMATION Mainly shale and argillaceous limestone (Upper Devonian to Middle & Lower Devonian)

NOTE: Where map unit includes two formations, dominant unit determines color code used

GEOCHEMICAL SAMPLE PLAN AND OUTCROP GEOLOGY MAP

MINK CLAIM GROUP

DAWSON MINING DISTRICT

OGILVIE MOUNTAINS PROJECT AREA

YUKON TERRITORY

PREPARED FOR

INEXCO MINING COMPANY

GEOPHOTO SERVICES LTD. CALGARY, ALBERTA, CANADA

A SUBSIDIARY OF TEXAS INSTRUMENTS INCORPORATED

SCALE

1 inch = 500 feet

500 375 250 125 0 500 1000 feet

NOVEMBER 1973

Contour interval 100 feet

Map # M-204 Figure

Figure 26

MAR 2 1974

GEOCHEMICAL SOIL SAMPLE GRID PLAN (SOUTH)

MINK CLAIM GROUP

DAWSON MINING DISTRICT

OGILVIE MOUNTAINS PROJECT AREA

YUKON TERRITORY

PREPARED FOR

INEXCO MINING COMPANY

GEOPHOTO SERVICES LTD. CALGARY ALBERTA CANADA

A SUBSIDIARY OF TEXAS INSTRUMENTS INCORPORATED

SCALE

1 inch = 50 feet

50 25 0 50 100

NOV 1973

LEGEND

GEOCHEMICAL SOIL SAMPLES

AB6-20-35-202	Sample location and number (1973 Field Program) followed by hot extraction analysis values for copper, lead and zinc respectively in ppm. (A to F prefixes denote sampler)

ROCK SAMPLES

AR6	Sample location and number. Second letter R, signifies rock sample (A to F prefixes denote sampler). Assay values do not appear on maps (see report for Geophoto AA and Loring Laboratory assay results).

GEOLOGIC SYMBOLS

25	Strike and dip of bedding measured by field traverses 1969-73
70	Overturned bedding
	Jointing-vertical
70	Jointing-Dipping
	Rock outcrop in heavily mantled or talus covered area
Cu	Mineralized float

Map # M-205 Figure 26

GEOCHEMICAL SOIL SAMPLE
GRID PLAN (NORTH)

MINK CLAIM GROUP

DAWSON MINING DISTRICT

OGILVIE MOUNTAINS PROJECT AREA

YUKON TERRITORY

PREPARED FOR

INEXCO MINING COMPANY

A SUBSIDIARY OF
TEXAS INSTRUMENTS INCORPORATED

SCALE
1 inch = 50 feet

50 25 0 50 100

NOV. 1973

LEGEND

GEOCHEMICAL SOIL SAMPLES

°A116-20-35-202 — Sample location and number (1973 Field Program) followed by hot extraction analysis values for copper, lead and zinc respectively in ppm. (A to F prefixes denote sampler).

ROCK SAMPLES

°AR6 — Sample location and number. Second letter R, signifies rock sample (A to F prefixes denote sampler). Assay values do not appear on maps (see report for Geophoto AA and Loring Laboratory assay results).

GEOLOGIC SYMBOLS

25 — Strike and dip of bedding measured by field traverses 1969-73

70 — Overturned bedding

Jointing-vertical

70 — Jointing-Dipping

Rock outcrop in heavily mantled or talus covered area

⊗Cu — Mineralized float

MAR 22 1974

GEOPHYSICAL SURVEY PLAN
ELECTRO-MAGNETIC

MINK CLAIM GROUP

DAWSON MINING DISTRICT
OGILVIE MOUNTAINS PROJECT AREA
YUKON TERRITORY

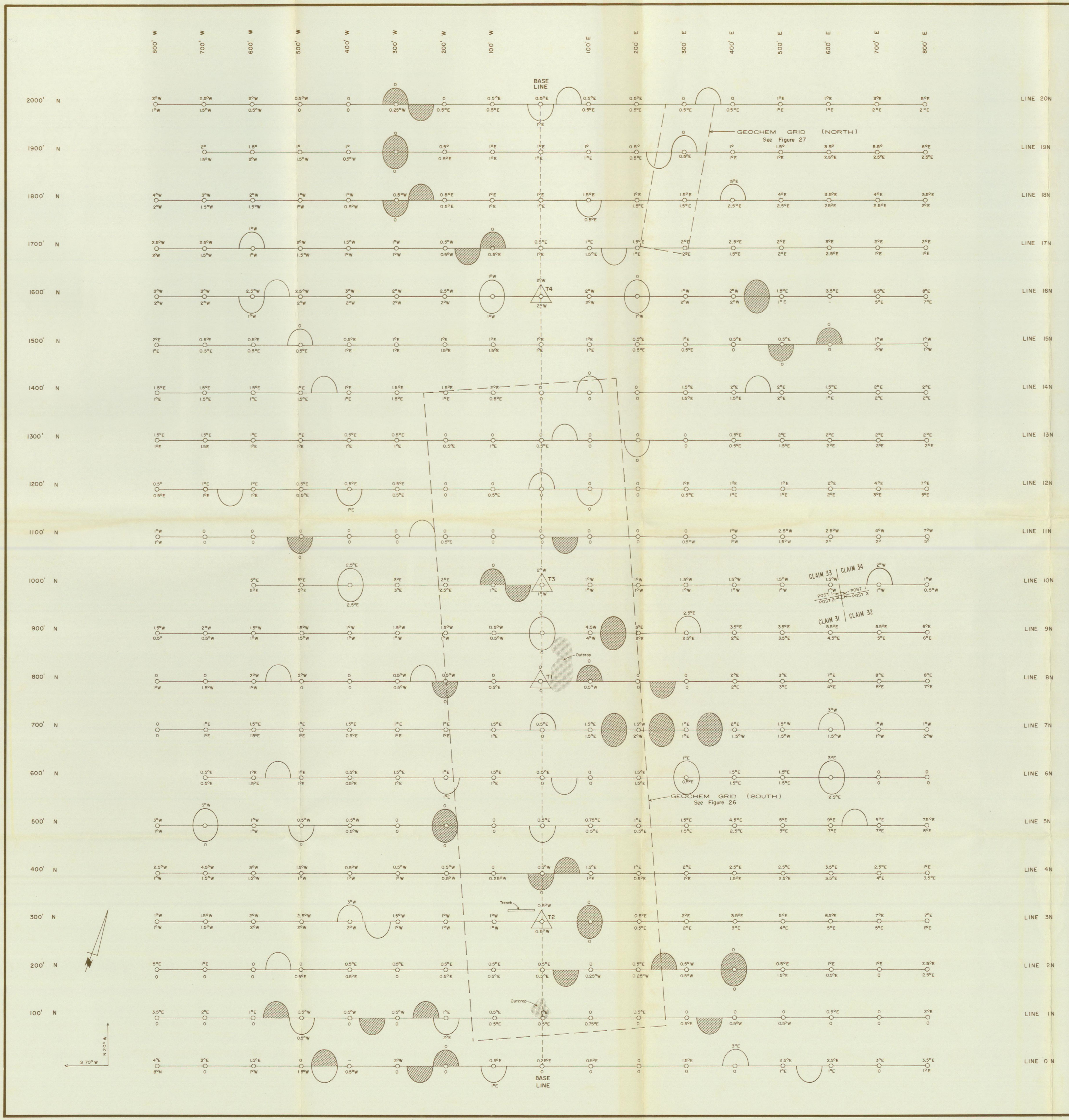
PREPARED FOR

INEXCO MINING COMPANY

GEOPHOTO SERVICES LTD.
CALGARY ALBERTA CANADA
A SUBSIDIARY OF
TEXAS INSTRUMENTS INCORPORATED

SCALE
1 inch = 100 feet

NOV. 1973



LEGEND

- 5000 c.p.s. reading / 1000 c.p.s. reading — Receiver dip angles in degrees east or west
- Inflection point (5000 c.p.s.)
- Inflection point (1000 c.p.s.)
- Cross over (5000 c.p.s.)
- Cross over (1000 c.p.s.)
- T1 — Transmitter location for lines 6N, 7N, 9N, 10N.
- T2 — Transmitter location for lines 0N, 1N, 2N, 4N, 5N, 8N.
- T3 — Transmitter location for lines 3N, 16N.
- T4 — Transmitter location for lines 11N, 12N, 13N, 14N, 15N, 17N, 18N, 19N, 20N.

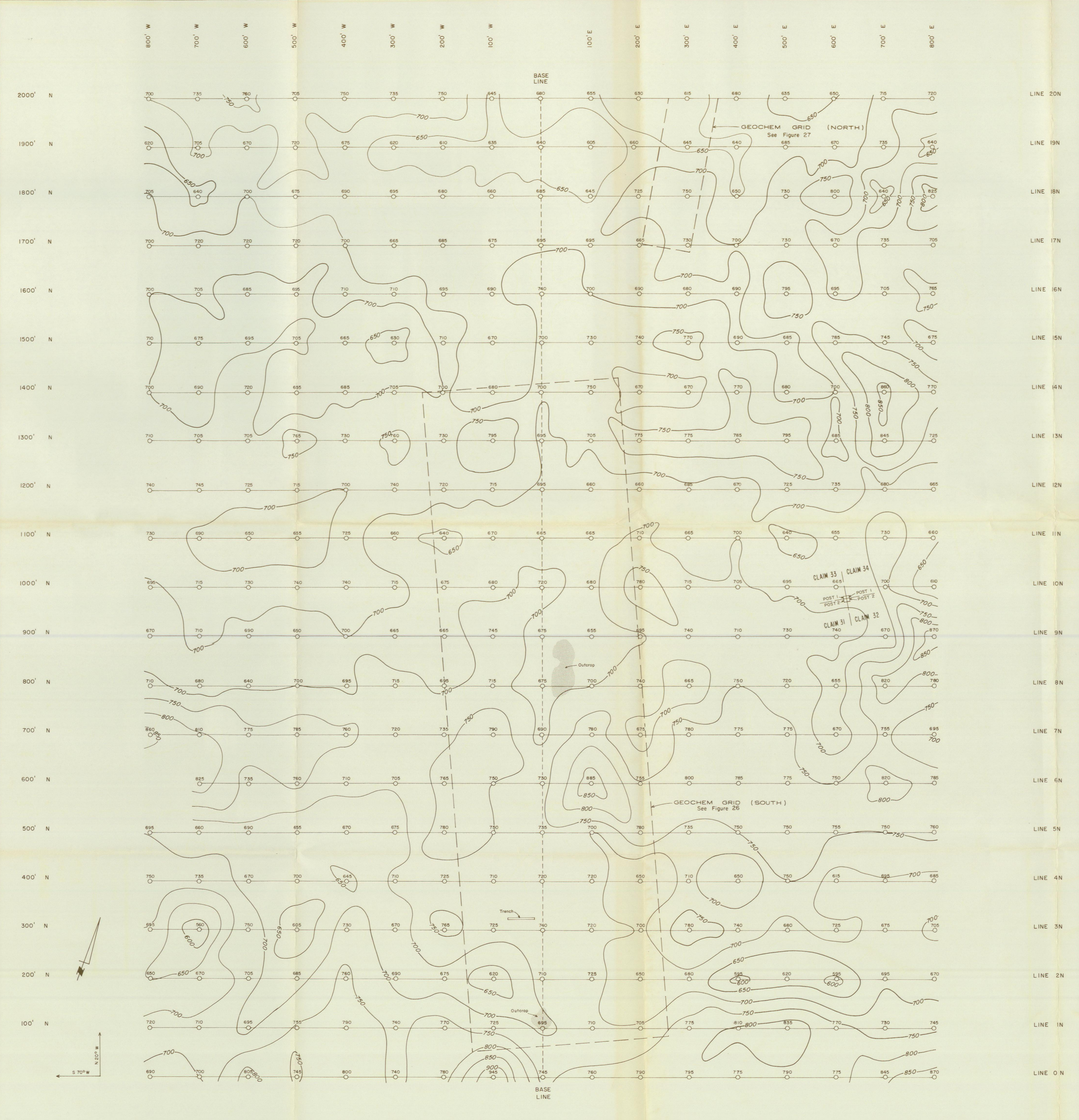


Figure 29

GEOPHYSICAL SURVEY PLAN

MAGNETOMETER

MINK CLAIM GROUP

DAWSON MINING DISTRICT

OGILVIE MOUNTAINS PROJECT AREA

YUKON TERRITORY

PREPARED FOR

INEXCO MINING COMPANY

MAR 22 1974

GEOPHOTO SERVICES LTD
CALGARY ALBERTA CANADA

A SUBSIDIARY OF
TEXAS INSTRUMENTS INCORPORATED

SCALE
1 inch = 100 feet

100 75 50 25 0 100 200

NOV. 1973

LEGEND

Magnetometer survey (100 foot grid system)

750 Corrected readings in gammas

650 Contour interval - 50 gammas

Outcrop Rock outcrop area

LEGEND

SEDIMENTARY SEQUENCE

NOTE Where a map unit includes more than one formation, the unit is color coded as to the apparently dominant unit

Unit	Description
Ka	LOWER CRETACEOUS (ALBIAN), Mainly shales with upper conglomerate unit, lower shale unit may locally include Kg, upper conglomerate unit equivalent to Kathul Greywacke of Alaska
Kg	LOWER CRETACEOUS (NEOCOMIAN), GOODENOUGH FORMATION, Mainly shale, equivalent to Biederman Argillite of Alaska, locally may include "Albian" strata
Kmc	LOWER CRETACEOUS (NEOCOMIAN), MARTIN CREEK FORMATION, Mainly Orthoquartzite / sandstone, equivalent to Keenan Quartzite of Alaska
Kh	LOWER CRETACEOUS (NEOCOMIAN), HUSKY FORMATION, Mainly shale, may include Jurassic and Triassic, equivalent to Glenn Shale of Alaska
T̄R	UPPER TRIASSIC, (SHUBLIK equivalent) Shale, siltstone, limestone
Ps/T̄R	PERMIAN and / or TRIASSIC ? (STEP CONGLOMERATE) Conglomerate unit, locally unit may be Jurassic
Pt	PERMIAN, TAHKANDIT FORMATION Mainly chert, limestone
Psh	PERMIAN, SHALE, Probably Jungle Creek and/or Tahkandit equivalent
Pjc	PERMIAN, JUNGLE CREEK FORMATION Shale, limestone
Pe	PERMO-PENN, ETTRAIN FORMATION, Mainly cherty limestone, fossiliferous
Mhr	MISSISSIPPIAN, HART RIVER FORMATION, Shale, siltstone, minor limestone, chert
Dnr	UPPER DEVONIAN, NATION RIVER FORMATION, Sand and conglomerate
Du	UPPER ? and MIDDLE DEVONIAN, UNNAMED SHALE UNIT, Black siliceous shale and chert
Do x	MIDDLE DEVONIAN, OGILVIE FORMATION, Mainly limestone, Dos stringocephalus present; x - denotes reefoid beds
Dg	MIDDLE and LOWER ? DEVONIAN, GOSSAGE FORMATION, Mainly dolomite, occasional limestone
Dmi	LOWER DEVONIAN, MICHELLE FORMATION, Mainly limestone, fossiliferous
OSrr	ORDOVICIAN - SILURIAN, ROAD RIVER FORMATION, Mainly graptolitic shale and limestone
€O x	€AMBRIAN - UPPER ORDOVICIAN, Limestone and dolomite; (jr) Jones Ridge Limestone, x - denotes reefoid beds
P€	PRE €AMBRIAN, TINDIR GROUP SEDIMENTARY ROCKS, Carbonate, shale, sandstone

Mhr, Du: HART RIVER and UNNAMED SHALE, Unit undivided

Dpc: PRONGS CREEK FORMATION, Mainly shale and argillaceous lime-stone

Dmh: McCANN HILL CHERT FORMATION, Mainly shale and chert

Srr

Orr

IGNEOUS ROCKS

GRANITIC

MONZONITE PORPHYRY DYKE

BASIC SILL OR FLOW

MINERALIZATION, Cu - Copper, Ag - Silver, Pb - Lead, Zn - Zinc, Fe - Iron

Formation contact, defined, assumed

Marker bed

Fault contact, defined and assumed, ∇ indicates dip of thrust plane, ⚲ indicates downthrown side

Anticline, upright and overturned (trace of crestal plane/surface intersection

Syncline, upright and overturned

Location of traversed or measured section (1972)

•Cx119-72 Location of observation at spot locality

Strike and dip of bedding measured
- 30 measured
- H 30 estimated from helicopter (1972)
- R 30 recorded by Riddell (1970)
- F 30 recorded by Fitzgerald (1969)
- P 30 measured / estimated by photogeology (Geophoto & V Zay Smith)

65 Bedding flat, vertical and overturned

15 Apparent dip and direction of bedding

INEXCO OIL COMPANY
CALGARY ALBERTA CANADA

KANDIK BASIN
YUKON TERRITORY
SURFACE GEOLOGY
MAP "H"

GEOLOGY BY	DATE NOV., 1973	DRAWN BY
REVISED	DATE	MAP Nº 227
	SCALE 1" = 4000'	BASE