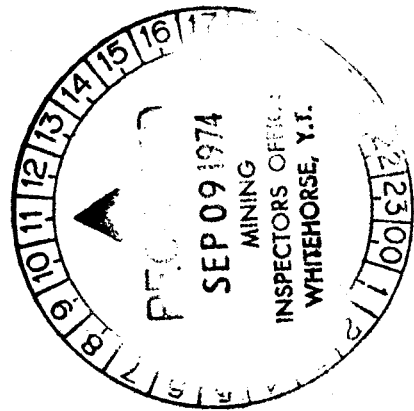




116-G-3 - 165191

GEOLOGICAL & GEOCHEMICAL REPORT
ON THE BEAR CLAIM GROUP



Claim Sheet 116-G-3

139° 10'W - 65° 10'N

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 \$ 2,000.00

Resident Geologist or
Resident Mining Engineer

John R. O'Donnell

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

May 30th - July 21/73

Commissioner of Yukon Territory

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In Field Folder Accompanying This Report:

- Figure # 30 Bear Claim Group - Geologic Map & Claim Location
 Scale 1" = 2,000'
- Figure # 31 Bear Claim Group - Geochemical Sample Plan & Outcrop Geology
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- Figure # 32 Bear Claim Group - Geochemical Soil Sample Grid Plan
 Scale 1" = 100'
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 Scale 1" = 2,000'

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 Siddeley 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 use^t 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^o and 225^o 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 Geophoto AA laboratory in Calgary.

A 0.5 gram portion of each sieved sample was digested in 1:1 nitric acid at 90° 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, lead 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:

<u>Element</u>	<u>Background</u>	<u>Threshold</u>
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 ~~same~~ 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 ~~the~~ 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 surface 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.

BEAR CLAIM GROUP

Introduction

The Bear Claim Group is located 35 miles west of the boundary Dempster Highway/blackstone River crossing and occurs in the east-west trending Central Ogilvie Ranges. A main northern-flowing tributary of the Ogilvie River flows along the eastern portion of the claim group. Signs of lead mineralization were located directly west of this stream while conducting a routine ground geologic traverse across terrain underlain by Cambrian-Ordovician carbonates. Rusty-colored carbonate float samples with a scattering of galena crystals were collected along a talus-covered slope at the western end of the large 10 mile long Bear Anticline.

The Bear Claim Group, consisting of 42 north-south oriented claims, was staked by Inexco Oil Company in the early spring of 1973 to protect this area of suspected lead mineralization. Professional claim stakers laid out the claim grid and then dropped the claim posts on the ground at their respective locations, a common winter staking practice. The first task confronted by Geophoto Services personnel was to set upright and tag all the claim posts on the Bear Claim 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 the field operations.

One of the top priorities of the 1973 field program was to prospect the Bear Claim Group and locate the source of the earlier

reported lead mineralization. A detailed geochemical and geologic appraisal were to be conducted over the claim group as a whole in an effort to locate additional occurrences of mineralization or extensions of the zone represented by the earlier reported galena float.

The exploration methods used involved intensive prospecting of all accessible outcrops (very limited) and talus slopes in an effort to locate surface mineralization. Geochemical stream sediment sampling, as well as, soil geochemistry were employed to evaluate the suspected mineralized locations. A detailed soil sample grid system was laid out in the vicinity of the talus-covered slope that yielded lead bearing float. Ground geophysics was not feasible on the Bear Claim Group.

A total of 27 man-days were spent on the Bear Claim Group, six of which involved hand trenching and prospect pit excavations.

The results of the prospecting efforts and geological and geochemical surveys on the Bear Claim Group are discussed in the following pages.

GEOLOGY

The Bear Claim Group is located near the western end of the 8 to 10 mile long east-west trending Bear Anticline. The claim group proper spans a 10,500 foot north-south by 9,000 foot east-west area almost entirely underlain by Cambrian-Ordovician age carbonates. Figure 30 shows the geologic setting of the claim group in reference to the surrounding area.

Silurian-Ordovician age graptolitic shales of the Road River Formation outcrop at the extreme southern end of the claim group. Devonian-

age carbonates of the Ogilvie Foramtion are associated with tongues of argillaceous limestones and shales of the Prongs Creek Formation, to the south of the Bear Claim Group. Four miles north-northeast of the claim group, dolomites of the Middle Devonian age

Cossage Formation underlie the Ogilvie Formation limestones and a fairly thick sequence of Upper Devonian age siliceous shales and cherts occur stratigraphically above the Middle Devonian carbonates. These in turn are overlain by dark shales, siltstones and argillaceous limestones of the Mississippian-age Hart River Formation. The oldest rocks exposed in the area consist of Precambrian age carbonates, sandstones and shales with similarities to the Tindir Group of the Yukon-Alaska border areas to the west. These late Precambrian age sediments outcrop one mile east of the Bear Claim Group in the central core of the Bear Anticline.

Although the greater part of the Bear Claim Group is underlain by unnamed Cambrian-Ordovician age carbonates, good exposures of this unit are limited. The elongated north-south trending hill and lower-lying ridge (see Figure 31) centrally located within the claim group contained good exposures of this massive light to dark grey dolomite in only two general areas. Craggy exposures occur along the southeastern flank of the hill (4, 170') and at the extreme northern end of the flat topped ridge to the north. The rounded hill top at the westcentral edge of the claim group likewise exposed a substantial outcrop of this massive bedded dolomite. The gentle to moderately westerly dipping beds of this unit, outcropping on the Bear Claim Group, were quite difficult to measure attitudes on because of the thick - to massive-bedded nature of these carbonates. Both dolomites and limestones occur here and the more coarsely crystalline dolomite horizons are often quite siliceous in nature. Irregular shaped pods of quartz, as well as, fairly thick layers of bedded chert occur in these carbonates. A peculiar horizon of rounded to elongated patches of crystalline quartz of

possible secondary origin was noted in the heavily mantled upper slope of hill (4, 170').

Cambrian-Ordovician age carbonates have been overthrust onto younger fine-grained clastics of the Road River Formation along the south end of the Bear Claim Group. Dark grey to blue-black fissile shales with distinctive calcareous and siliceous horizons occur here. Examination of limited outcrops to the west to the claim group revealed that the occasional more resistant horizons of the Road River Formation contained very argillaceous limestone layers interbedded with the much thicker recessive calcareous and siliceous shales.

The single outcrop of Middle Devonian-age Ogilvie Formation limestone occurring immediately south of claim 15 (see Figure 31) was not typical of this formation as it occurs further north in the 1969 project area. Shales and argillaceous limestones of the Devonian-age Prongs Creek Formation are closely associated and not differentiated from the dark to medium-grey limestones of the Ogilvie Formation at this locality.

The poorly exposed outcrop of unnamed Upper Devonian shale occurring south of the Bear Claim Group was examined briefly at one locality and consists of recessive dark grey to brownish-weathering calcareous shale with intervals of laminated medium-grey calcareous siltstone also present. These beds were in many ways quite similar to the shales and argillaceous limestones of the Prongs Creek Formation occurring not far to the north.

Two northwesterly trending normal faults with upthrown blocks to the southeast cross portions of the Bear Claim Group. The central of these two fault zones separates the low, northward-projecting flat topped ridge (Claims 23 and 25)

from the higher rounded hilltop (4, 170') to the south.

The trace of a broadly curving thrust zone along the southern flank of this same hill is marked by the abrupt lithologic change from resistant competent Cambrian-Ordovician carbonates to recessive Road River shales. The younger shale horizon is heavily mantled and tree covered in comparison with the light-toned bald hill of talus-covered carbonate debris to the north. This thrust zone continues northeastwardly across the large northern-flowing tributary at the east end of the claim group. Here Cambrian-Ordovician age carbonates are overthrust onto rocks of the same age before this thrust fault merges with the axis of the Bear Anticline two miles to the east.

Geochemical Survey

Geochemical sampling operations on the Bear Claim Group may be divided into three categories consisting of: 1) a mixture of stream sediment and soil samples collected from small intermittent drainage areas and seepage zones along the break in slopes, 2) a series of randomly-spaced soil samples collected from the side slopes and top of the prominent talus-covered hills and 3) a north-oriented geochemical soil sample grid system established along the mineralized eastern flank of the main carbonate hill (4, 170').

Lead mineralization consisting of a highly fractured disseminated vein of galena in a buff to light brown-weathered siliceous zone was located earlier in the prospecting. This zone was located by tracing lead-bearing float up-slope along the talus covered-slope in claims 20 and 33.

A total of 261 geochemical samples were collected from the Bear Claim Group of which 137 consisted of a mixture of soil and stream sediment samples from the

Group as a whole (see Figure 21) and 124 consisted of soil samples from the geochemical grid system (see Figure 32). The collection of these samples was closely tied to prospecting activities as geochemical and prospecting traverses were conducted simultaneously in most instances.

The silt samples were bagged, numbered and returned to the base camp for sieving and drying operations prior to being sent to Geophoto Services', AA laboratory in Calgary for analysis in copper, lead and zinc. Statistically determined geochemical background and threshold values were established.

The threshold values used were 46 ppm for copper, 40 ppm for lead, and 270 ppm for zinc. All values exceeding threshold levels are considered anomalous.

Random Geochemical Samples - The stream sediment and soil samples collected along the mineralized portion of the eastern flank of hill (4, 170') ranged from a high of 1,000 ppm lead near the highly shattered and weathered showing of lead mineralization to a 83 to 305 ppm lead range, 400 to 1,500 feet down-slope (see Figure 31). This highly anomalous pattern of lead geochemical values is likewise reflected by an almost identical pattern of anomalous zinc values. The anomalous geochemical zinc values from this same down-slope vicinity range from 304 to 1,440 ppm with a fair scattering of samples reporting under threshold values along the edges of the dispersion pattern.

Above the poorly defined mineralized area, an abrupt cut-off of both lead and zinc values occurs. Several anomalous lead and zinc values occur to the north and south along the eastern flank of this hillside. Further confirmation that the major anomalous geochemical zone on the Bear Claim Group is located along the

eastern flank of this northerly trending hill and ridge is the fact that all anomalous values occurring further west are very erratic in distribution and show no discernable pattern. Whether the widely scattered anomalous lead and zinc values occurring west of the main zone reflect mineralization is not known.

The most promising of these widely scattered geochemical values is represented by sample F 123, collected 2,000 feet to the north of and near the base of the hill located midway along the western boundary of the claim group. This sample reported an extremely anomalous 286 ppm lead and 1,500 ppm zinc. The other geochemical samples, collected from the top of this hill and along its north and northeastern flanks, assayed background values in zinc except for samples F 116 and F 118 from the hill top which assayed 374 and 478 ppm zinc respectively. A series of slightly anomalous lead values, varying from a high of 73 ppm at the hill top to a 47 to 51 ppm range along the small northern-flowing tributary directly west of claim 9 were also reported from this portion of the claim group. No signs of mineralization were noted in this erratically anomalous area.

Samples F 370 and F 203, from the southwestern and northwestern flank of hill (4, 170'), each reported anomalous values in both lead and zinc.

The southern most of these samples (F 370) reported 110 ppm lead and 365 ppm zinc, and was collected from the talus-covered hillside well above the thrust fault cutting across the south end of the hill (4, 170'). Samples F 371 and F 366, collected 400 and 800 feet respectively to the east and southeast of this anomalous sample (F 370) reported slightly anomalous lead values of 50 and 44 ppm respectively. A weakly defined rusty zone of hematite and limonite-stained carbonate talus material and associated light orange to yellow soil patches were noted along the

southwestern flank of the main hill but no signs of mineralization were located.

Sample F 203, from the northwestern flank of this talus-covered hillside (claim 19), reported 60 ppm lead and 283 ppm zinc. A series of weakly anomalous lead values ranging from 42 to 47 ppm occurs along a zone extending 1,000 feet to the north of F 203. Widely scattered rusty orange to brown soil zones were erratically distributed across this talus-covered slope of limestone and dolomitic rock debris.

A fairly large number of anomalous lead values occur both to the north and south of the main anomalous dispersion pattern defined by the mineralization occurring on claim 20.

Anomalous lead values were noted along the eastern flank of the main hill up to 2,000 feet to the south this highly anomalous zone. Geochemical silt sample B 120 collected at the base of the slope below the northernmost group of dolomite pinnacles assayed 360 ppm lead and 326 ppm zinc and may indicate mineralization occurs to the south of the geochemical soil sample grid system (Figure 32). Sample F 231 collected near the south end of this northern group of pinnacles or crags reported a highly anomalous 229 ppm lead and 1,030 ppm zinc. No signs of mineralization were associated with these jagged outcrops of dolomite but the major thrust zone passes nearby and offers a favorable structural setting. Samples F 96 and F 97 from still further up-slope above this outcrop reported anomalous lead values of 56 and 72 ppm respectively. Sample B 112 collected near the base of this eastern slope and 1,600 feet southeast of the highly anomalous dispersion pattern still assayed 109 ppm lead. Two additional soil samples collected still further south of B 122 report slightly anomalous lead

values of 40 ppm and 50 ppm.

To the north of the mineralized zone, anomalous lead values in the 40 to 104 ppm range occur along the lower 2/3 of the eastern-facing slope. Sample F 255, collected along this slope 450 feet northeast of the northeastern corner of the geochemical grid system reported 82 ppm lead. A fairly good scattering of anomalous lead values in the 50 to 62 ppm range occur nearby. A second grouping of anomalous lead values occurs 2,000 feet further north of sample F 255, in the vicinity of the centrally located northwesterly trending fault zone shown on Figure 31. Geochemical silt sample F 271 from this locality assayed 104 ppm lead and 319 ppm zinc.

This series of anomalous lead values with a scattering of anomalous zinc values extends along a north-south zone over 6,000 feet in length. This extensive zone of anomalous geochemical samples occurs along the eastern flank of the centrally located hill and adjoining flat-topped ridge. The poorly defined mineralized zone examined on claim 20 has a northeasterly strike that would project into the alluvial-filled river valley at a point near the north end of claim 35. The southwestern projection of this mineralized zone (strike S 35° W) would cross the eastern boundary of claim 17, 400 feet east of peak (4,170'). The geochemical survey suggests the possibility of widespread mineralization along this eastern flank of the elongated north-trending hill and ridge.

A definite geochemical cut-off is shown up-slope of this theoretical southwestern projection of the mineralized zone by silt samples F 242 to F 246. Samples F 237 to F 241, likewise, suggest a definite cut-off defining the southwestern limit

of this projected trend of possible mineralization. A geochemical sampling gap occurs in claim 18 up-slope from samples F 96 and F 97 and to the west of samples F 234 and F 235. This unsampled slope directly above the northeasterly-trending trace of the thrust zone makes it difficult to fully evaluate the possibility of a southwestern extension of the mineralization known to occur in claim 20. A southern extension of the geochemical grid system (Figure 32) was planned during the 1973 field program but poor weather conditions toward the end of the field season prevented its completion.

Soil Sample Grid System - A 1,000 foot long north-south by 900 foot east-west geochemical grid system (see Figure 32) was established and is roughly centered on the single mineralized outcrop located on claim 20. Soil samples were collected at 100-foot intervals along this talus-covered slope. Fairly good but widely scattered soil zones occur in the rock debris along this slope. Galena-bearing float was noted at several locations along this fairly steep, talus-covered slope. The first occurrence of mineralized float, represented by sample FR 18, was followed up-slope to the extremely shattered and deeply weathered siliceous zone. Closer examination of this buff to light brown material revealed disseminated galena crystals. Additional signs of similar galena-bearing float were noted to the southwest and northeast of this poorly defined in-situ zone of lead mineralization.

The soil samples collected along this talus-covered slope came from scattered soil zones occurring within the angular rock debris. Small terrace-like ledges and minor benches in the slope quite often acted as a trap for silt-sized material working its way down-slope during intermittent intervals of surface run-off.

Other zones of silt-size soil material had become trapped in moss and grass patches along the hillside. The matt formed by this vegetation served as an excellent accumulator of silt-sized soil particles. Great care was exercised in collecting appropriate soil material although distinctive soil horizons often common in true residual soils were not developed here. The down-slope migration of mechanical particles, including grains of mineralized material, no doubt contributed to the anomalous nature of these soil samples, as well as, the geochemical solution, dispersion and absorption of metal ions.

The lead distribution on Figure 32 shows several strong anomalous patterns or zones roughly extending from the southwest corner of the grid system to the northeast corner. The strongest lead anomaly is associated with the known mineralization at the outcrop near soil sample D 336. This soil sample reported an extremely anomalous 268 ppm copper, 7,400 ppm lead and 32,200 ppm zinc. Lead values in the 246 to 307 ppm range occur around this mineralization in a down-slope and southerly direction.

The second most prominent grouping of highly anomalous lead values is defined by the northwesterly alignment of three soil samples E 247, E 257 and D 365 reporting 1,850, 800 and 625 ppm lead respectively. The highly anomalous sample E 247 was collected 300 feet southwest of the small mineralized showing. Abundant evidence of mineralized float occurs both above and down-slope from sample D 247 but are not reported from the northwestern direction in the vicinity of anomalous samples D 366 and E 257. This westerly-trending bulge in the geochemical pattern is not explained by the presence of mineralized float. Soil sample D 364, assaying 635 ppm lead, occurs 225 feet further up-slope to the southwest and represents the furthest up-slope occurrence of lead float from the soil sample grid area. Anomalous con-

ditions persist to the south and the boundary of the geochemical grid is still open ended in that direction.

Two prominent areas of lead highs or anomalies occur down-slope and to the northeast of the mineralized outcrop. A dog-legged pattern of high lead values ranging from 437 to 711 ppm lead is defined by soil samples E 221, D 324 and E 215. Two-hundred feet further northeast lead values ranging from 311 to 521 ppm are reported by samples E 220, D 319 and E 217. Lead-bearing float occurs up-slope from this general portion of the grid system.

A broad plateau-like pattern of anomalous lead values reporting above 100 ppm extends from the southern border of the grid system in a northeasterly direction until it merges with the highly anomalous zone surrounding the known lead showing. This plateau of fairly high lead values is open to the south, as well as, down-slope to the east.

The entire eastern border of the grid system is anomalous and open to the east. This is to be expected in the down-slope direction where the normal dispersion of lead ions supplemented by mechanical dispersion has operated.

A sharp geochemical lead cut-off occurs up-slope and to the southwest of the anomalous zones previously discussed. Although more than one parallel zone of mineralization may be present along the eastern and southeastern portions of the grid system, it is doubtful that additional zones of lead mineralization occur in this northwestern direction.

The pattern of anomalous zinc values occurring along the southeastern portion of the soil sample grid does not coincide perfectly with the previously discussed lead distribution pattern but geochemical peaks occur in the same general

vicinity. The overall pattern, although more restricted in the case of anomalous zinc values, suggests a definite association with the anomalous lead distribution. Sample D 336, collected just to the northeast of the known lead showing, reported an extremely anomalous 32,200 ppm zinc. An abrupt cut-off occurs up-slope to the west of this location. Sample location E 247, 300 feet to the southwest of the known mineralization, reported 1,460 ppm zinc and likewise coincides with one of the high lead values reported earlier.

Sample E 221 to the northeast of the poorly defined mineralized outcrop reported 1,100 ppm zinc and extends the main trend of anomalous zinc values almost parallel with the lateral dimensions outlined by lead. Dispersion fans and trains again extend downslope to the east of these fairly to highly anomalous zinc values.

One obvious circular zinc pattern occurs above (northwest of) the fairly sharp up-slope cut-off. Samples D 359 and E 249 occurring over 400 feet northwest of the mineralized outcrop reported 1,050 ppm and 367 ppm zinc respectively. The significance of these isolated high zinc values is not understood. The talus slope in this direction becomes quite heavily covered by large blocks of siliceous dolomite and limestone from far up-slope. Perhaps additional zones of mineralization occur under this extensive talus-covered slope which masks all but this anomalous zone that reaches close enough to the surface to be reflected through the thick cover of talus. The peculiar westward extension of anomalous lead values shown by samples D 365 and E 257 may, likewise, reflect another point along a heavily mantled, more westerly zone of mineralization.

Prospecting Results

All rock outcrops in the claim group with the exception of those occurring at the extreme northeast end of the claim group were carefully prospected for signs of mineralization. Not even weak indications of mineralization were noted except along the highly anomalous eastern flank of the elongated northern trending hill.

Only limited prospecting was conducted along the western border of the claim group (claims 7, 9 and 11). This area looks very encouraging from the standpoint of the nearby northwesterly trending fault zone and the highly anomalous geochemical sample F 123 (286 ppm lead, 1,500 ppm zinc).

Prospecting at the north end of the flat-topped ridge (claims 25, 27) also failed to reveal any signs of mineralization. The light-grey dolomite occurring here is highly fractured and jointed (NW-NE pairs) and rusty stained zones of secondary calcite were common but barren of sulphide mineralization.

Additional prospecting and geochemical sampling should be conducted along the overthrust zone at the base of the southernmost flank of the large hill (4,170'). The lower reaches of the southern-facing slope are covered by a thick growth of brush and tree cover but structurally the zone is encouraging.

Galena-bearing float was first located 300 feet down-slope from the poorly defined mineralization shown in Plate 24. Sample FR 18 of this material later assayed 1.74% lead, 6.75% zinc and 0.68 oz./ton silver. The float sample consists of buff to white leached siliceous dolomite with sparsely scattered grains of crystalline galena imbedded in the siliceous material. Porous zones contained quartz crystals in vugs and along fracture surfaces.

Following this float up-slope, a highly shattered zone of poorly exposed galena mineralization was located. Fresh broken surfaces along this buff to light brown-weathered siliceous zone exposed weakly mineralized zones containing disseminated galena crystals in a spongy siliceous matrix. The in-situ mineralized zone varies in width from 2 to 3 feet and was traced for 15 to 20 feet along a S 35° W strike direction. Weak indications of malachite staining were noted on one sample of this material. Sample FR 19 of this in-situ mineralization assayed 0.34% copper, 8.16% lead and 24.53 % zinc by atomic absorption analysis.

Binocular microscope examination of this material revealed moderately strong mineralization consisting of medium to coarse grained blebs and crystals of galena in a spongy siliceous to dolomitic matrix that contained evidence of extreme leaching. Sphalerite was not present to account for the high zinc content. Zinc is probably present as smithsonite or calamine and is not readily recognizable in the spongy, porous matrix. A check assay of sample FR 19 by Loring Laboratories reported 0.35% copper, 8.61% lead, 23.42% zinc and 6.40 oz./ton silver. The silver and zinc content of this material is encouraging but sample FR 19 is a grab sample representing some of the better grade material from this zone. Lean to completely barren portions (no visible galena) occur along this narrow zone of intense alteration and fracturing with the stronger mineralized portions distributed quite erratically. Galena crystals are scattered throughout much of the brownish-yellow country rock but gradually fade out along the margins of this zone where a green grey dolomite borders the mineralized zone with a fairly sharp contact. Highly associated zones are quite common.

A fairly extensive zone of widely scattered galena float was traced 200 feet further southwest of this in-situ mineralized zone. Sample FR 20, representing some of the better grade float, reported 5.94% lead, 0.22% zinc and 1.04 oz./ton silver. A second high grade sample (BR8), collected at the lower end of this float train, reported 28.18% lead, 0.13% zinc and 1.46 oz./ton silver.

The lower zinc values associated with the float samples collected to the southwest of the mineralized zone are not fully understood. The galena crystals in these later two samples occur in a lighter grey to whitish country rock than the buff to yellow-brown siliceous material of the mineralized showing proper.

Galena-bearing float extends along a 900 foot northwesterly trending zone within the geochemical soil sample grid proper. Prospecting to the southwest up-slope and along this same trend yielded scattered occurrences of galena bearing float for an additional 600 feet beyond the southwest corner of the grid system. The galena crystals were not as large or closely spaced as the samples collected to the northeast and the leached siliceous appearance of the country rock was not as well defined as further northeast. Nevertheless, the total length of this wide-spread zone of mineralized float defines a southwesterly trending zone well over 1,500 feet long and may represent multiple zones of mineralization. The float occurring to the southwest of the in-situ mineralization appears to be located further up-slope than the projected S 35° W strike would suggest.

Trenching and Prospect Pits

Hand trenching operations in the vicinity of the mineralized zone were successful enough to show that the buff brown zone of lead-zinc mineralization was indeed in place. The highly shattered and weathered nature of

this zone prevented the collection of representative chip or channel samples. The mineralized zone was exposed for a total length of 25 feet in a hand excavated trench 3 feet deep by 3 feet wide. The zone gradually faded out or narrowed in the northeast direction where an additional 5 foot length of trench failed to continue in the mineralized zone. The up-slope talus material was close to the angle of repose and difficult to keep out of the trench. Deeper hand trenching or blasting here could prove quite dangerous unless a large bench area was cut into the hillside by a bulldozer.

Two prospect pits, 5 feet deep by 5 feet in diameter were hand excavated 200 feet to the southwest of the trench. The abundant signs of mineralized float nearby prompted this effort but bedrock was not reached and water began to flood the bottom of the pits. Both pits were abandoned and added little to the understanding of the source of the suspected mineralization to the southwest of the main showing.

Conclusions

The lead mineralization examined on the Bear Claim Group varies from spotty, submarginal zones to moderately strong clusters of disseminated galena crystals and blebs. The occasional stronger mineralized zones up to 4 and 5 inches in length occur with a very erratic distribution and it is doubtful that average assays along any portion of the exposed vein would yield ore-grade material. The siliceous borders of the 3 to 4 foot-wide mineralized zone are either lean or barren and all signs of mineralization have faded out in the grey dolomitic country rock bordering the poorly defined vein.

Some of the mineralized float material is highly brecciated suggesting

possible shear or fracture zones. The widespread distribution of signs of lead mineralization along the eastern flank of hill (4, 170') is encouraging. Mineralized float was traced along a 1,500 foot southwesterly trending zone and the extent of anomalous geochemical patterns along this same flank is even more widespread.

Several promising target areas have already been localized within the boundaries of the detailed geochemical soil sample grid system. All evidence points to an extension of the main zone of anomalous lead and zinc values in a southwest direction along the unsampled portion of the talus slope to the west and southwest of the three prominent rock pinnacles.

A fairly large southern extension to the existing geochemical soil sample network should be conducted here.

A highly anomalous combined lead-zinc geochemical value was reported along the western boundary of the claim group not far east of one of the northeasterly trending normal faults that cut across the claim group. Additional prospecting and geochemistry are needed in this vicinity, as no evidence of mineralization was noted here during prospecting efforts, and the nature of this geochemical anomaly is not understood.

Bulldozer trenching would be the only feasible method of further investigating the possible extension of the main mineralization suspected of occurring along the talus-covered slope at the southeastern end of the claim group. Hand trenching is next to impossible with the steep angle of repose and even a bulldozer would have difficulties negotiating this fairly steep eastern flank of the hill (4, 170').

BEAR ANTICLINE AREA

A total of 101 reconnaissance geochemical samples were collected from the east-west trending Bear Anticline area. This structural trend is the logical area to check for extensions of the favorable zones of lead and zinc mineralization located on the Bear Claim Group to the west.

The flanks of the Bear Anticline consist of light grey, massive-bedded Cambrian-Ordovician age carbonates shown by the pink color pattern on Figure 34. The darker toned central core of Late Precambrian age clastics and carbonates is shown by a brown pattern on Figure 34 and includes most of the long northern flowing tributary systems draining this axial portion of the structure. A fairly large easterly-flowing stream enters the western end of this structure and meanders easterly across the entire axial portion of the anticline before breaching the structure and continuing north to the Ogilvie River. The well defined meander pattern of this main stream suggests an antecedent drainage system with typical incised meanders.

A total of sixteen anomalous lead values are reported from the Bear Anticline sample area.

These values range from a threshold value of 40 ppm lead to a high of 82 ppm. The westernmost of the northerly flowing tributaries at the centre of the structure (E 142 to E 146) reported lead values ranging between 52 and 62 ppm. Other scattered slightly anomalous lead values are reported at the heads of some of the tributaries to the east of this stream.

Across the valley to the northeast, the centrally located southern-flowing tributary (C 191 to C 198) reported anomalous lead values ranging from 40 to 82 ppm. Sample C 196 from a left hand tributary of this drainage system reported 82 ppm lead, the highest value encountered along the main portion of the Bear Anticline.

Copper values occurring along the Bear Anticline range from 4 to 18 ppm and are not considered significant. Zinc values are likewise in the background to lower range and the area does not warrant investigation from that standpoint.

Conclusions - A limited check of the two anomalous lead tributaries on the Bear Anticline area is recommended in conjunction with work on the Bear Claim Group to the west. The Squirrel and Bern areas contain only 2 or 3 marginally anomalous values and do not warrant further prospecting or follow-up checks unless personnel are in these areas for other purposes.

GEOLOGIC MAP AND CLAIM LOCATION MAP

BEAR CLAIM GROUP

DAWSON MINING DISTRICT
OGILVIE MOUNTAINS PROJECT AREA
YUKON TERRITORY

PREPARED FOR

INEXCO MINING COMPANY



SCALE
1 inch = 2000 feet
2000 1000 0 2000 4000

NOVEMBER 1973

LEGEND

GEOLOGIC MAP UNITS

- QUATERNARY Q Surficial deposits (unconsolidated)
- 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 EO Limestone and dolomite
- PRECAMBRIAN pE TINDIR GROUP
Carbonates, shale, sandstone
- Dpc PRONGS CREEK FORMATION
Mainly shale and argillaceous limestone

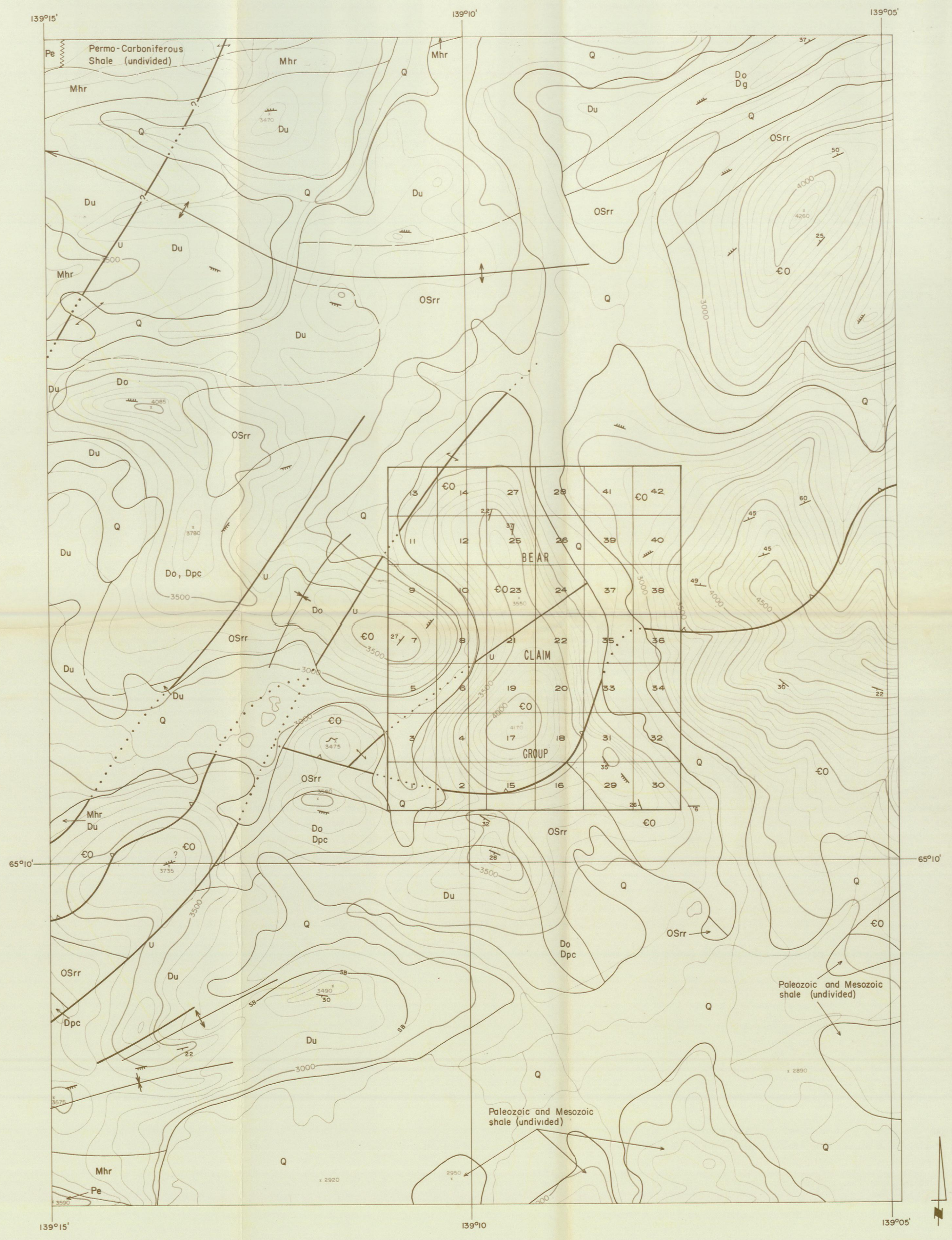
NOTE: Where map unit includes two formations, dominant unit determines color code used
Geology based on 1972 Inexco mapping with minor revisions and additions by Geophoto. Claim boundaries based on diagram supplied by Inexco Mining Company.

GEOLOGIC SYMBOLS

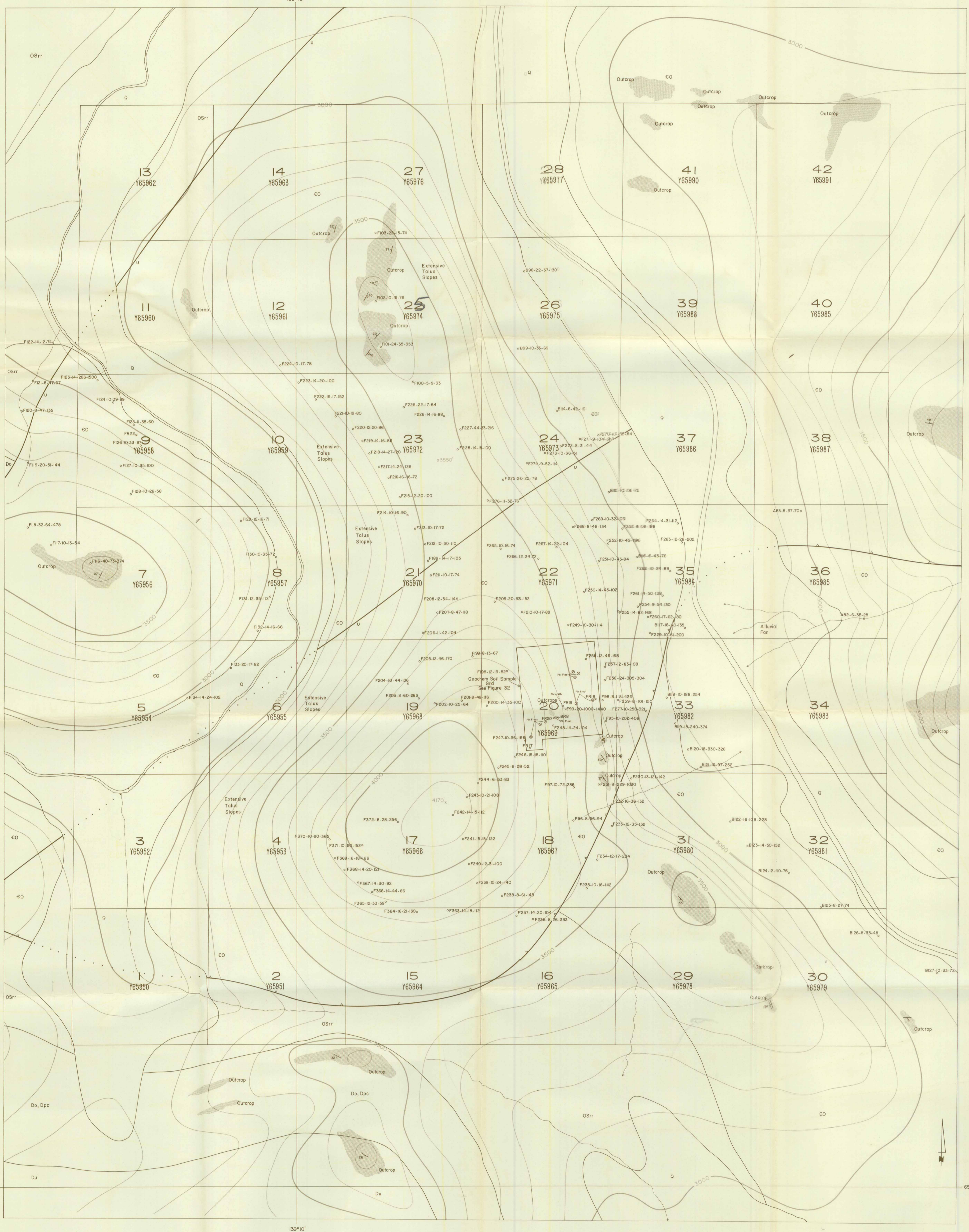
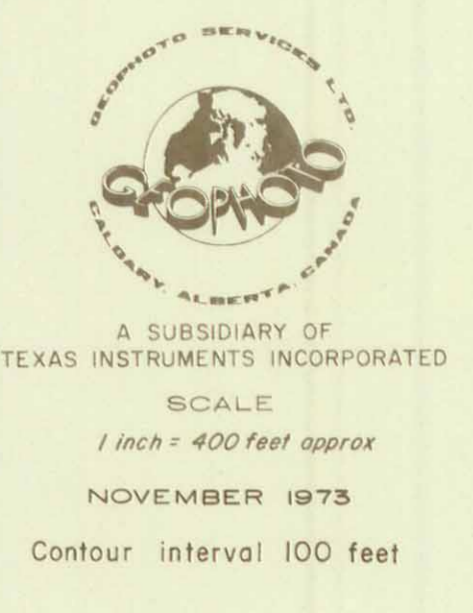
- $\frac{25}{\text{---}}$ Strike and dip of bedding measured by field traverses 1969-73
- $\frac{70}{\text{---}}$ Overturned bedding
- \oplus Horizontal
- $\frac{1}{\text{---}}$ Dip less than 3°
- $\frac{3}{\text{---}}$ Dip 3° to 10°
- $\frac{11}{\text{---}}$ Dip 11° to 26°
- $\frac{26}{\text{---}}$ Dip 26° to 45°
- $\frac{45}{\text{---}}$ Dip more than 45°
- \ominus Vertical
- --- jointing-vertical
- --- jointing-Dipping
- --- Formational contact - dashed where approximate
- --- Stratigraphic break
- --- 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

PHYSICAL FEATURES

- x 3362' Spot elevation
- --- River
- --- Stream



GEOCHEMICAL SAMPLE PLAN
AND OUTCROP GEOLOGY MAP
BEAR CLAIM GROUP
DAWSON MINING DISTRICT
OGILVIE MOUNTAINS PROJECT AREA
YUKON TERRITORY
PREPARED FOR
INEXCO MINING COMPANY



LEGEND

GEOLOGIC MAP UNITS

QUATERNARY	Q	Surficial deposits (unconsolidated)
TERTIARY		
UPPER CRETACEOUS	Ku	Sandstone, minor shale
LOWER CRETACEOUS	Ko	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	T	SIBUEL FM. equivalent Shale, siltstone, limestone
PERMIAN	Pt	TARKENTON FORMATION Mainly chert, limestone
	Pjc	JUNGLE CREEK FORMATION Shale, limestone, conglomerate
PERMO-PENNSYLVANIAN	Pr	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	GOSAGE FORMATION Mainly dolomite, some limestone
SILURIAN ORDOVICIAN	OSrr	ROAD RIVER FORMATION Mainly graphitic shale, some limestone
ORDOVICIAN	CO	Limestone and dolomite
PRECAMBRIAN	pc	TINDIR GROUP Carbonates, shale, sandstone

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

GEOCHEMICAL STREAM SEDIMENT AND SOIL SAMPLES

*A16-20-35-202 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 samples).

*R395-16-85-500 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

*A86 Sample location and number. Second letter R, signifies rock sample (A to F prefixes denote samples). Assay values do not appear on maps (see report for Geophot AA and Loring Laboratory assay results).

PHYSICAL FEATURES

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

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

— Stream

GEOLOGIC SYMBOLS

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

— Overturned bedding

— Horizontal bedding

— Dip less than 3°

— Dip 3° to 10°

— Dip 11° to 26°

— Dip 26° to 45°

— Dip more than 45°

— Vertical

— Jointing-vertical

— Jointing-Dipping

— Formational contact - dashed where approximate

— Stratigraphic break

— 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

— 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.

MAR 22 1974



GEOCHEMICAL SOIL SAMPLE
GRID PLAN
BEAR 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 = 100 feet



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

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

RECONNAISSANCE
GEOCHEMICAL SAMPLE PLAN
BEAR ANTICLINE AREA
DAWSON MINING DISTRICT
OGILVIE MOUNTAINS PROJECT AREA
YUKON TERRITORY
PREPARED FOR
INEXCO MINING COMPANY



A SUBSIDIARY OF
TEXAS INSTRUMENTS INCORPORATED

SCALE
1 inch = 2000 feet

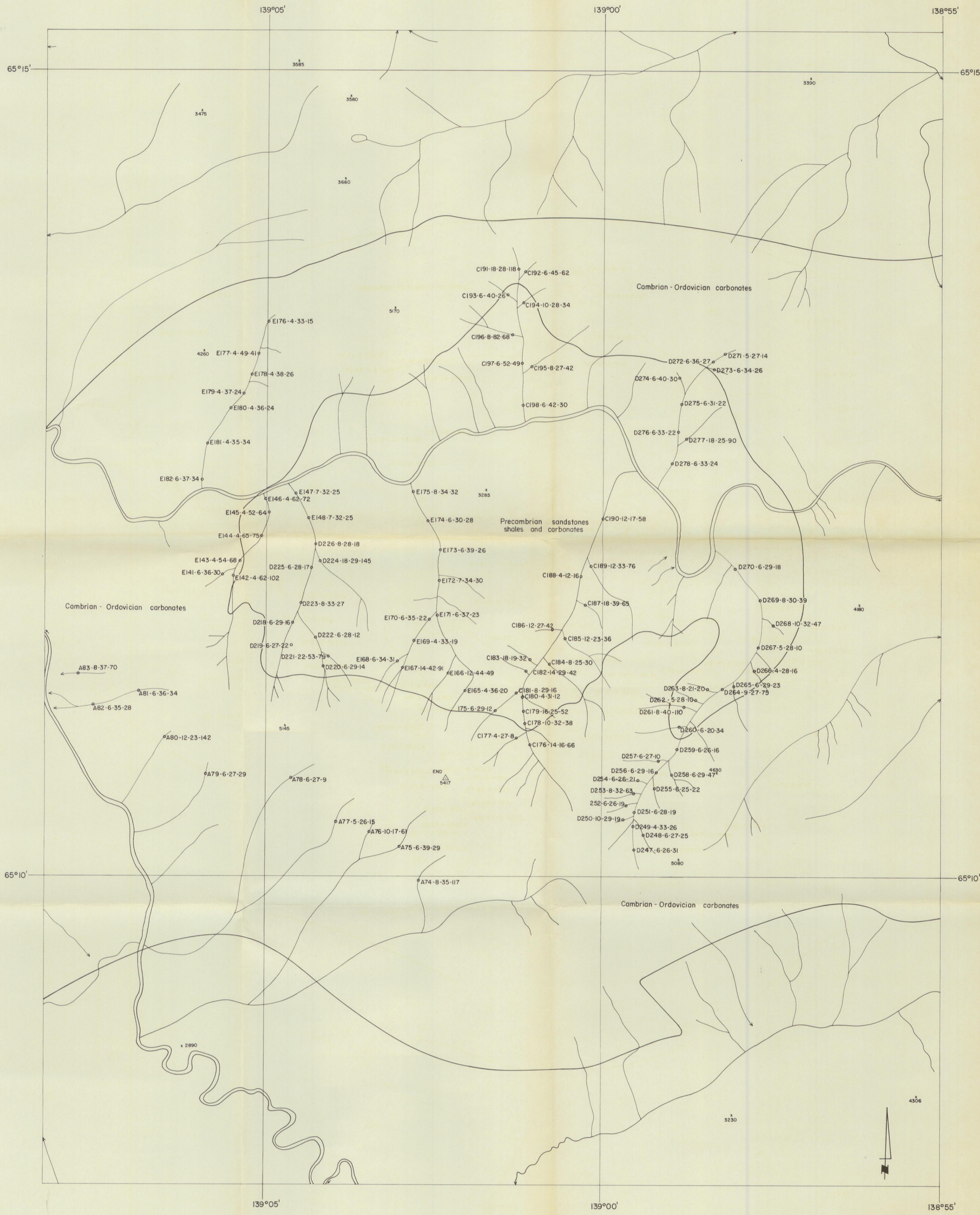
NOVEMBER 1973

LEGEND

GEOCHEMICAL STREAM SEDIMENT SAMPLES

°A16-20-35-202 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).

NOTE: Pink colored portion represents outcrop area containing predominately Cambrian-Ordovician age carbonates. Brown colored areas consist of Precambrian age sandstones, shales and carbonates (Tindir Group?).





LEGEND

SEDIMENTARY SEQUENCE

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

- 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
- T** UPPER TRIASSIC, (SHUBLIK equivalent) Shale, siltstone, limestone
- P₁/B** 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, Du** 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** MIDDLE DEVONIAN, OGLIVIE FORMATION, Mainly limestone, Dos stringocephalus present; x - denotes reefoid beds
- Dg** MIDDLE and LOWER DEVONIAN, GOSSAGE FORMATION, Mainly dolomite, occasional limestone
- Dm** LOWER DEVONIAN, MICHELLE FORMATION, Mainly limestone, fossiliferous
- OSrr** ORDOVICIAN-SILURIAN, ROAD RIVER FORMATION, Mainly graphitic shale and limestone
- EO** CAMBRIAN-UPPER ORDOVICIAN, Limestone and dolomite; (r) Jones Ridge Limestone, x - denotes reefoid beds
- PE** PRE-CAMBRIAN TINDIR GROUP SEDIMENTARY ROCKS, Carbonate shale, sandstone

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)**
- *C/19-72** Location of observation at spot locality
- Strike and dip of bedding measured**: estimated from helicopter (1972), recorded by Riddell (1970), recorded by Fitzgerald (1969), measured/estimated by photogeology (Geophoto & V. Zay Smith)
- Bedding flat, vertical and overturned**
- Apparent dip and direction of bedding**

INEXCO OIL COMPANY
CALGARY ALBERTA CANADA

KANDIK BASIN
YUKON TERRITORY
SURFACE GEOLOGY

MAP "C"

DESIGNED BY	DATE	DEC, 1973	DRAWN BY
REVISED	DATE		MAP NO.
	SCALE	1" = 4000'	BASIS
			222