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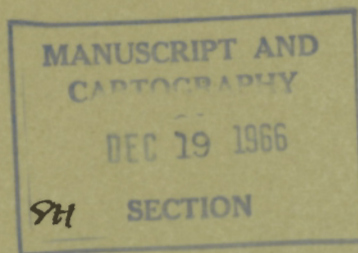
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PAPER 66-52

MINERAL INDUSTRY OF THE NORTHWEST TERRITORIES  
1965

R.I. Thorpe





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ABSTRACT

This report reviews the mining and exploration activities undertaken in Mackenzie and Keewatin Districts in 1965. Mining is only carried out in Mackenzie District. The four principal gold producers-Giant Yellowknife Mines Limited, Con-Rycon Mines, Discovery Mines Limited, and Tundra Gold Mines Limited - had a total production of 446,582 ounces of gold bullion. Echo Bay Mines Limited had a profitable year with a production of 1,408,246 ounces of silver. Pine Point Mines Limited continued shipments of high-grade crude ore with a total of 364,168 tons shipped, and the mill began operation, on schedule, in November.

Exploration in Mackenzie District was carried out in a number of areas as follows: Pine Point - a major staking rush drew numerous companies to the Northwest Territories for the first time. Many thousands of claims were staked and some induced polarization surveys were performed. Two important new deposits were discovered by Pyramid Mining Company. Sulphur Bay - An induced polarization survey and diamond drilling was carried out by Elgin Petroleum Corporation and geological mapping and diamond drilling by the Consolidated Mining and Smelting Company. Coronation Gulf - Extensive trenching was carried out on gold veins on the James River Mines and Consolidated Manitoba Mines properties. Bathurst Inlet - Prospecting was continued by Roberts Mining Company and limited drilling programs were carried out on the Turner Lake and Pistol Lake gold properties. Hope Bay - Basic prospecting was carried out by Roberts Mining Company in this area. Yellowknife - Drilling was carried out by Rodstrom Yellowknife Mines Limited and Kerr Addison Mines Limited. Surface mapping and some diamond drilling was done by the Falconbridge-Giant Yellowknife interests. Clan Lake - A Drill program tested the gold-bearing veins discovered the previous year. Johnston Lake - A geological mapping program by Giant Yellowknife Mines covered an area at the north end of the lake. Snare River - A drill program for Anglo United Development Corporation tested the potential of a previously known gold occurrence. Indian Mountain Lake - International Mine Services Limited carried out a broad exploration program for base metal deposits. Geophysical surveys covered most of a large block of claims and some follow-up drilling was done. East Arm Area - Nahanni Mines Limited staked a number of properties with low grade copper showings and carried out geological mapping and trenching programs. During 1965, 14,979 claims were recorded in Mackenzie Mining District.

In Keewatin District, Selco Exploration Company continued a program of basic prospecting. Mr. J. Kilgour and associates continued prospecting and trenching in the vicinity of Snowbird Lake. Hudson Bay Mining and Smelting Company carried out prospecting in the general Kasba Lake - Ennadai Lake area. Kennco Explorations carried out a geophysical survey on a small property near Hudson Bay.

## I N T R O D U C T I O N

This is the sixth in a series of annual reports on the mineral industry of the Northwest Territories. These reports (Baragar, 1961; 1962; Baragar and Hornbrook, 1963; Schiller and Hornbrook, 1964; Schiller, 1965) have dealt primarily with the Mackenzie District and to a limited degree with the Keewatin District. The report by Schiller (1965) included a summary, from secondary sources, of the iron property of Baffinland Iron Mines and the lead-zinc property of Bankeno Mines, both in Franklin District. Producing and developing mines are, as yet, restricted to Mackenzie District. A summary of production and development at these properties is included in this report. The writer acknowledges the hospitality of mining companies and personnel in the field and their cooperation in examining properties and reviewing company reports.

## M A C K E N Z I E D I S T R I C T

### TRANSPORTATION

The influence of the Great Slave Railway on mineral exploration became evident during the season. The most obviously related activity was a re-evaluation of the low grade copper deposits of the East Arm area of Great Slave Lake. Canadian Coachways has added a second daily bus from Edmonton to Hay River and Pine Point. Work was begun on an all-weather road linking Fort Smith to Pine Point and this road should be completed in another year.

Hay River served as the centre for a tremendous amount of staking activity in the Hay River-Pine Point area during the latter part of the season. However, Yellowknife, with a population in excess of 3,800 people, still served as the main centre for exploration and mining in the District. Except for periods of break-up (May-June) and freeze-up (November-December) in which traffic is suspended across the Mackenzie River, Yellowknife can be reached by an all-weather road from southerly points. Truck transport, barge, bus and aircraft provide freight and express services into Yellowknife. Shipping rates and schedules are as follows:



Trucking (Edmonton to Yellowknife)

Class . . . . .	1	2	3	4	5
Rate (dollars/100 lbs) . .	6.03	5.11	4.24	3.55	3.00

Bus (Express, Edmonton to Yellowknife three times weekly)

Pounds . . . . .	0-2	5-10	10-20	20-30	30-40	40-50
Charge . . . . .	\$1.60	2.10	2.95	3.60	4.50	4.95
Pounds . . . . .	50-90	60-70	70-80	80-90	90-100	
Charge . . . . .	5.85	6.80	8.05	9.30	10.60	

Air Cargo (daily scheduled service except Sunday)

Pounds	Edmonton to Yellowknife	Yellowknife to Edmonton
Less than 100 . . . . .	\$ .17/lb	\$ .09/lb
100 to 1,800 . . . . .	15.00/100 lb	8.00/100 lb
1,800 to 3,000 . . . . .	13.75/100 lb	7.00/100 lb
More than 3,000 . . . . .	12.00/100 lb	6.00/100 lb

Barge (Waterways to Yellowknife, June-October)

	Rate per cwt.
General Cargo . . . . .	\$ 1.75
Heavy Weights 2,000 to 10,000 lbs.	\$ 1.93
10,001 lbs and up	\$ 2.10

Railroad

Rate . . . . . Roma Junction to Hay River  
 \$300.00 per carload <sup>1</sup>(this charge applies only on traffic on which Canadian National Railways receives a road haul to or from Edmonton).

A wide range of "bush" aircraft are available for charter at Yellowknife, Hay River and Fort Smith. Charter helicopters are based at Hay River and Fort Smith.

<sup>1</sup>Subject to reduction depending on volume and duration of traffic.

### EXPLORATION

The most striking activity in 1965 was a major staking rush in the Pine Point area in the last quarter. The staking and exploration, sparked firstly by anticipated, and later confirmed, high profit by Pine Point Mines on shipments of crude high grade ore, and secondly by ore discoveries by Pyramid Mining Co. which were announced at the beginning of November, drew a great number of companies to the Northwest Territories for the first time. Work was continued or initiated in a number of other areas scattered throughout the District. From January 1 to December 31, 1965, there were 14,979 claims recorded in the Mackenzie Mining District.

Areas of major activity and staking are as follows:

- 1) Pine Point-Hay River area (mineral claim sheets 85-A-13, 85-B-9, 10, 11, 12, 13, 14, 15, 16) - The staking rush in this area resulted in claim staking in all of the mineral claim sheet areas listed and is expected to proceed until essentially all of the area from the Little Buffalo River to the Hay River and lying between Great Slave Lake and Wood Buffalo Park is completely staked. High grade crude ore shipments were made by Pine Point Mines throughout the year and the mill started operation on schedule in November.
- 2) Sulphur Bay area (mineral claim sheets 85-G-5 and 12; 85-F-8) - Egin Petroleum Corp. (wholly owned subsidiary of Rayrock Mines Ltd.) conducted geophysical and diamond drilling programs on its 141-claim property. The Consolidated Mining and Smelting Company did mapping and additional diamond drilling on its property.
- 3) Clan Lake-Johnson Lake area (85-J-16) - The Earl-Jack Syndicate supervised a drill program on their Clan Lake discovery of the previous season with discouraging results. Giant Yellowknife Mines conducted a mapping program on a property at Johnson Lake and a number of prospectors were active in the area.

- 4) Coronation Gulf area (mineral claim sheets 75-M-11 and 12) - McIntyre Porcupine Mines Ltd., Consolidated Manitoba Mines Ltd., and the James River Syndicate were active in evaluation of their properties. Extensive trenching by Consolidated Manitoba Mines resulted in the location of new gold-bearing quartz veins of potential ore grade.
- 5) Bathurst Inlet area (76-N-2 and 6; 76-K-14) - Roberts Mining Company conducted a limited diamond drill program on a gold property located near the Hood River.
- 6) Hope Bay - Elu Inlet area (77-A-3, 6) - Roberts Mining Company continued a reconnaissance exploration program and carried out semi-detailed examination of gold showings.
- 7) Indian Mountain Lake - Benjamin Lake area (mineral claim sheet 75-M-2) - International Mine Services conducted extensive geophysical work to test base metal possibilities on the properties of Prima Metal Mines Ltd., Snowdrift Base Metals Mines Ltd., Murky Fault Metal Mines Ltd. and Indian Mountain Metal Mines Ltd. Some follow-up diamond drilling was done.
- 8) Snare River (85-N-8) - Anglo United Development Corp. conducted an intensive drill program on their 20-claim gold property.
- 9) Indin Lake area (86-B-6) - Falconbridge Nickel Mines carried out a limited diamond drilling program on a gold property.
- 10) Methews Lake (76-D-3) - Giant Yellowknife Mines Ltd. did some drilling in rhyolite to test EM anomalies obtained in a search for copper deposits.

- 11) East Arm area of Great Slave Lake - Nahanni Mines Ltd. conducted an extensive program of geological mapping and trenching on properties with low grade copper showings.

Highland-Bell Limited conducted a reconnaissance investigation of copper showings within the Coppermine lavas in the Dismal Lake - Coppermine River area. A few claims were staked on old showings. The company also maintained an exploration party in the Nonacho Lake area where the ONA group was staked on a known radioactive occurrence and a limited drill program was carried out.

Internation Mine Services Limited sponsored a party investigating the potential of base metal showings in the vicinity of the northern part of Nonacho Lake.

In 1965 the prospector assistance program of the Department of Northern Affairs and National Resources aided 32 prospectors working in Mackenzie and Keewatin Districts to the amount of about \$24,340.00. The program provides up to \$900.00 per man to individual and company prospectors who spend more than 60 days in the field in the Northwest Territories.

## DESCRIPTION OF PROPERTIES

IO and CJ Groups, Anglo United Development Company Limited

The company owns a block of 20 claims consisting of I.O. 1-6,8,9,11-16 and C.J. 1-6. These claims were staked in 1944 and 1945. The property is located on the Snare River approximately 7 miles southwest of the lower powerhouse ( $63^{\circ} 21' N.$ ,  $116^{\circ} 18' W.$ ; mineral claim sheet 85-N-8). A gold showing has been known on the property for some years and is shown on the geological map of the area by the Geological Survey of Canada (Map 690A). The property has been very briefly described by Lord (1951, p.263). In the years 1945 and 1946 drilling which totalled 7,400 feet indicated 50,000 tons of gold-bearing material of moderate grade. During the 1965 season drilling on the property was supervised by Precambrian Mining Services. A total of 14,335 feet in 44 holes was drilled on the property. The country rock is greywacke and argillaceous greywacke of the Yellowknife Group which has been fairly highly metamorphosed. In drill core it is noted that nodular and non-nodular metasediments rapidly alternate with one another. The nodular sections may have developed from more argillaceous, less siliceous sediment. The knots appear to consist of clots of biotite and chlorite. The greywacke sequence strikes  $N 20^{\circ} W$  and dips, although values as low as  $45^{\circ}$  have been recorded, are generally quite steep to the east.

The original showing is now known as the No. 1 zone. The No.2 zone lies parallel and approximately 100 feet to the east. The zones strike  $N 20^{\circ} W$  and dip steeply east, apparently parallel to the strata. In these zones ore grade sections 100 feet and 500 feet in length, for the No. 1 and No. 2 zones respectively, have been defined to a depth of 450 feet by systematic drilling. Visible gold was observed in a high percentage of the holes and the average grade that is indicated for a mining width of 4 feet is 0.65 oz. gold per ton. A single long hole tested the zones at a depth of about 750 feet. Twenty-nine holes for a total of 11,212 feet, were drilled in testing the No.1 and No. 2 zones. Much pink aplite has been intruded along these zones and adds to the difficulties involved in their evaluation.

A hole, based on geological mapping, was drilled about 1000 feet south of the No. 1 and No. 2 zones and resulted in a high grade intersection. Additional drilling indicated that the South Zone consists of several lenticular quartz bodies occurring along strike in a single structure. In a number of core intersections the zone is represented by abundant quartz stringers, generally parallel to the bedding, rather than a single well-defined vein of quartz. Some visible gold can be seen in the core. The quartz is white to dark grey in colour and is generally translucent. Very little mineralization is to be seen in the quartz, although flattened crystals of arsenopyrite are present on the bedding planes of the greywacke. The South Zone has been tested by a series of 15 holes representing a total footage of 3,123 feet. The zone has only been tested at a depth of 50 feet and additional drilling has been recommended to test the zone at depth.

MAR, IAN and RAE Groups

These claim groups are located on the west side of Marian Lake (mineral claim sheet 85-K-16) and were staked in June, 1965, for Giant Yellowknife Mines Ltd. The claims in part cover old claim groups by the same name.

The MAR (27 claims) and IAN (12 claims) groups are located where Precambrian inliers are exposed through green and red shales and other sediments, of Ordovician age (Douglas and Norris, 1960). The RAE (16 claims) group appears to be located entirely on brown massive dolomite of Ordovician age which overlies the shale unit.

These properties were only given a preliminary examination during the 1965 season. Either detailed geological mapping or, possibly, a scintillometer survey will be carried out during 1966.

HID and MW Groups, Norris Lake

Mr. A. V. Giauque recorded the HID 1-6 claims in July and the MW 1-6 claims in August. These claims cover a point of ground at the north end of Norris Lake (mineral claim sheet 86-B-5) on which a gold showing has been known for some years (Map 697A, Geological Survey of Canada). Considerable drilling has previously been done on part of the property. Mr. Giauque directed his attention to lead-zinc mineralization and silver values associated with the gold-bearing veins.

One showing lies along the east edge of the point and consists of a zone approximately 10 feet wide in which considerable sphalerite, some galena, quartz, pyrite, and pyrrhotite, and minor amounts of chalcopyrite and graphite, are present. This zone lies along the contact of black shale, on the east, and a narrow band of coarsely crystalline marble. Grey well-bedded argillite and siltstone are exposed across most of the point.

A second showing near the west side of the point consists of an isolated outcrop of white quartz containing fairly abundant coarsely crystalline galena and sphalerite. Some pyrite and pyrrhotite are also present and large blebs or "eyes" of clear quartz are included in the more massive sulphides. Because of the isolated nature of this showing no estimate of size can be made.

Five grab samples taken by Mr. Giauque from showings on the property gave the following assay results:

<u>Au (oz.)</u>	<u>Ag(oz.)</u>	<u>Pb%</u>	<u>Zn%</u>	<u>Cu%</u>
tr.	9.59	17.3	2.1	
tr.	3.75			0.35
-	.20			0.15
tr.	8.12	21.9	13.5	
0.22	4.80			

Only a few of the samples were assayed for each of the base metals. The last sample is from the zone which was previously drilled to evaluate its gold potential.



The property has been taken under option by Prosper Oils Limited and work is planned for the 1966 season.

FNS Claims, Hottah Lake

The first group of claims to be staked in the Paleozoic area west of Hottah Lake (mineral claim sheet 86-D-15) was recorded in June, 1965, by Dr. G. A. Collins and Dr. F. N. Smith of Toronto. The FNS group of 45 claims covers low-grade copper showings.

FAG Group

The FAG group of 17 claims is located at Indin Lake (mineral claim sheet 86-B-6) and the south half of the property is a restaking of part of the old Echo Indin property. The claims were recorded on October 1, 1964, and are held by Falconbridge Nickel Mines Ltd. Mr. A. Gamble was in charge of the work on the property and the diamond drill core was logged by R. W. Spence of Giant Yellowknife Mines Ltd. The claim group was geologically mapped on a scale of 400 feet to the inch. The group covers a north-south striking belt of volcanic rocks which is about 3,500 feet in width. Two small areas on the claim group were mapped on a scale of 40 feet to the inch. One of these areas was located in the southeast corner of claim FAG 2. The second area was located on claim FAG 11 and here a total of 1097 feet of drilling in 6 holes along a length of about 480 was carried out on the main quartz-carbonate zone. The quartz veins of this zone contain some arsenopyrite mineralization and cut andesitic volcanics which may be tuffaceous in origin. Although some good assays were obtained on samples from surface trenching, no values of interest were intersected in the drilling.

Rodstrom Yellowknife Mines Limited

The company owns a gold property 4 miles northwest of Yellowknife (mineral claim sheets 85-J-8,9). The property is a 56 claim block consisting of the contiguous claim groups J 1-13, JC, JC 1-3, ED 1-4, C 1-16, R 1-10 and PG 1-9. In 1963 and 1964 detailed geological mapping, trenching, and diamond drilling were carried out on the property (Schiller and Hornbrook, 1964, p.33; Schiller, 1965, p.37). The diamond drilling totalled 2,013 feet in 27 holes in 1963 and 8,920 feet in 75 holes in 1964. In 1965 a deep drill hole penetrated to a depth of about 3,100 feet in the granite country rock without any significant intersections.

PRW Group

Early in the year Kerr Addison Mines Ltd. took an option on the PRW property at Vee Lake (85-J-9) which is controlled by Ryanor Mines Limited and proceeded with magnetic and electromagnetic surveys and diamond drilling. Work on the property commenced in February. The magnetic and electromagnetic surveys were conducted on the ice and covered the western arm of Vee Lake on claims PRW 14 and PRW 6. Four holes totalling  $3044\frac{1}{2}$  feet were drilled in March and April 1965. The longest of these, 1008 feet, was drilled toward the east at  $45^{\circ}$  inclination from a point on the west shore of Vee Lake. A second hole (756 feet in length) was drilled in the same direction and with the same inclination from a point 550 feet east on the lake. Basic to intermediate volcanics of the Yellowknife Group, showing some shearing, were intersected in all four holes.

### Clan Lake Area

The NOSE group of claims lie 1 mile east of the southeast arm of Clan Lake (mineral claim sheet 85-J-16) and were recorded by the Earl-Jack Syndicate in 1964. A review of the general geology of the area, notes on the character of the main showings and some of the assay results on preliminary chip and grab samples have been given by Schiller (1965, p.10).

Work during 1965 consisted of trenching, sampling of the new and previous trenches, further magnetometer surveying, and diamond drilling. The work on the main zone on the property was as follows:

No. 1 Zone. Additional trenching on this zone brought the total to 8 trenches. A total of 1119 feet of drilling in 7 holes tested this zone. In addition, a long hole (833 feet), drilled from some distance to the east on claim NOSE 27, passed beneath the showing. Some visible gold was evident in the trenches and in drill core, but gold values proved erratic. The surface work defined a length of 70 feet along the zone with a grade of 1.08 oz. Au/ton over a width of 11 feet.

No. 2 Zone, Visible gold was also evident in trenches on this zone; the zone, however, is very restricted in extent. A total of 877 feet in 6 holes tested the zone but failed to give any good intersections.

No. 4 Zone. This zone occurs on claim NOSE 27 approximately 330 feet east of the boundary with claim NOSE 28. The zone has been tested by four small trenches and one 75 feet long. A diamond drill hole approximately 210 feet in length was drilled beneath the main trench. Some trenching was done between this area and where the No. 1 and No. 3 Zones cross the boundary between claims NOSE 27 and 28. One drill hole approximately 250 feet in length was drilled in this area, about 50 feet east of the boundary.

The immediate area was carefully prospected and a number of minor zones of shearing and quartz veining were investigated by trenches. The No. 11, 9, 12 and 10 Zones all lie on claim NOSE 28. In relation to the discovery section of the No. 1 Zone they lie, respectively, approximately 1000 feet west, 500 feet in a direction S 65° W, 800 feet southwest and 600 feet south. No. 9 Zone was

tested by 5 trenches and 6 small trenches were dug on the No. 10 Zone. A single trench on No. 11 Zone crosses a rusty schist zone with some stringers of quartz. Five trenches were established across a quartz and dacite breccia zone and rusty schist bands on the No. 12 Zone. The No. 13 Zone is located on claim NOSE 30 approximately 1050 feet in a direction N35°W from the discovery section of No. 1 Zone. Four small trenches investigated quartz stringers and narrow rusty schist zones in dacite.

#### J. M. Group

The JM group of 4 claims is located on the east side of Ryan Lake, 9 miles north of Yellowknife (mineral claim sheet 85-J-9). The property was optioned by Giant Yellowknife Mines from Mr. J. Jacobson. During 1965 the property was geologically mapped at 200 feet to the inch. Three weakly mineralized shears on the property cut andesite, gabbro and granodiorite. One of these shears can be traced for about 1000 feet on claims JM 3 and 4 and has been previously investigated by trenching and 31 diamond drill holes totalling about 6,700 feet. A second shear runs N 15° W across claim JM 2 and the southwest corner and claim JM 3 and thence into Ryan Lake. Some molybdenite and galena are revealed in old trenches. Another shear has been traced for 600 feet on a strike of N 50° W across the southern part of claim JM 2 and into Ryan Lake. Some iron-rich sphalerite is evident in trenches on the shear.

#### PJ Group

The PJ group of 15 claims is located about 28 miles north of Yellowknife (mineral claim sheet 85-J-16) and was staked in 1964 by Giant Yellowknife Mines Ltd. The property was geologically mapped on a scale of 400 feet to the inch during the 1965 season. The claims are underlain by volcanics and sediments of the Yellowknife Group. A sericite schist-chlorite schist alteration zone averaging 350 feet in width extends north-south across claims PJ 2 and 5. Samples from the property gave only low values in gold but the main alteration zone was considered to be of interest.

#### Johnston Lake

Giant Yellowknife Mines Ltd. carried out a geological mapping project of an area covered by 41 claims at the north end of Johnston Lake (mineral claim sheet 85-0-1). The claims are PAT 1-16, PAM 1-6, MAC 1-3, J.E.S. 1-9 and AI 1-7 and were mapped on a scale of 400 feet to the inch. The J.E.S. group

was optioned from J.E.Stevens and the PAT group from W. Ternowski. The AL group was staked for Giant Yellowknife Mines in February, 1965, and the PAM group in August, 1965. The MAC group was staked in April, 1965, by G. MacDonnell and subsequently purchased by Giant Yellowknife Mines Ltd.

The rocks in the area consist predominantly of a monotonous series of sediments, coarse greywacke to argillite, of the Yellowknife Group. The sediments generally strike about N 30° E and dip steeply. Only one fold has been clearly defined by the mapping. This fold is an anticline which is located on the J.E.S. group and plunges gently to the south. Many minor faults or shear zones containing either mineralised or barren quartz veins are found to be parallel or subparallel to the bedding in the sediments.

The South Zone is located along the boundary between claims PAT 8 and 9 and the boundary between PAT 7 and 10. This zone has been traced for a length of 2,400 feet and has an average width of 1.5 feet. The blue-grey quartz contains fairly coarse galena and arsenopyrite, and, in places, pyrite, pyrrhotite and traces of chalcopyrite. In trench No. 1 at the north end of the zone an assay of 1.09 oz. Au/ton was obtained over a width of 1 foot. Values of 0.72 and 1.09 oz. over 2.5 ft. have been obtained from trench No.2.

Elsewhere along the zone lower values have been obtained by channel sampling.

The Swamp Vein is an irregular vein located on claim J.E.S. 3. Trenching in 1946 by the Consolidated Mining and Smelting Company indicated 0.34 oz. Au/ton over 9 feet and 1.39 oz. Au/ton over 1.4 feet approximately 70 feet farther north along the vein. Two holes drilled at that time failed to give any encouraging results. The Ridge Zone is located near the east boundary of claim J.E.S. 5 and detailed trenching by the Consolidated Mining and Smelting Company in 1946 indicated 1.0 oz. Au/ton over a width of 0.6 feet and a length of 114 feet. A diamond drill hole gave 2.04 oz. Au/ton over a width of 0.7 feet.

The Cross Vein trends about N 20° W across the northeast corner of claim J.E.S. 6 and dips steeply to the southwest. Ten diamond drill holes by the Consolidated Mining and Smelting Company in 1946 indicated generally low values.



Three holes along a vein length of about 220 feet gave values of 0.25 oz. Au/ton over 1.6 feet, 0.33 oz. Au/ton over 0.7 feet, and 0.15 oz. Au/ton over 2.6 feet. It is reported that 17 tons of \$40 to \$50 ore was shipped from the vein in about 1938 or 1939.

The Hill Vein is  $\frac{1}{2}$  to  $1\frac{1}{2}$  feet in width and has been traced for a length of 600 feet along a strike of N 15°-20° E in the northwest corner of claim J.E.S. 1. The vein contains minor arsenopyrite and the best assays on chip samples were 0.78 oz. Au/ton over 1.5 feet and 0.13 oz. Au/ton over 1 ft.

The projected intersections of a number of the gold-bearing quartz veins with the western flank of the main anticline lie in a drift-filled depression extending northerly across claims J.E.S. 2 and 1. It is thought that this depression may mark a fault zone. A drill program is being considered to test this zone.

### Sunset Lake Property

A prospector worked for Giant Yellowknife Mines Ltd. in the Beau'ieu River - Beniah Lake - Sunset Lake area during the 1965 season. As a result of this work the 22-claim property (ALICE group) of Sunset Yellowknife Mines Ltd. was optioned by the company and an additional 18 claims (ANN group) were staked. These claims are shown on mineral claim sheet 85-I-16. Detailed geological mapping, possibly followed by diamond drilling, will be carried out on the property during the 1966 season.

RED Group

The RED group of 23 claims is located at the north end of Matthews Lake (mineral claim sheet 76-D-3) approximately 4 miles north of Tundra Mine. The claims thus lie within the barrens in an area of lakes, low rock exposures and glacial deposits. The claim group was recorded by Giant Yellowknife Mines during September, 1964.

The geology of the Matthews Lake area is shown on Map 1024A published by the Geological Survey of Canada. The claim group is underlain principally by massive rhyolite flows. A wedge of basic volcanic rock is present in the southeast corner of the group. Narrow sections of argillite and fragmental rhyolite are interbedded with the massive rhyolite flows.

Magnetic and electromagnetic surveys were conducted over the property in April. A number of electromagnetic anomalies were obtained in this work and some of these were tested by 4 diamond drill holes which totalled 2,175 feet. The drilling indicated that narrow seams of massive pyrite may be responsible for some of the anomalies. Faulting may account for some of the anomalies but two holes provided no evidence as to the cause of the anomalies drilled. The results of the drill program provided no encouragement for further work.

### Indian Mountain Lake Area

The Hirshhorn interests hold a large block of 355 claims covering most of the main anticlinal fold structure (Geological Survey of Canada maps 738A and 32-1963) of the Indian Mountain Lake - Benjamin Lake area (75-M-2). The companies holding properties are Prima Mining and Metal Co. Ltd. (83 claims), Snowdrift Base Metal Mines Ltd. (71 claims), Consolidated Marbenor Mines Ltd. (36 claims), Murky Fault Metal Mines Ltd. (51 claims) and Indian Mountain Metal Mines Ltd. (114 claims). The BB deposit just south of BB lake, on which drilling a number of years ago outlined approximately 1 million tons of zinc-lead-silver ore, is on the property of Indian Mountain Metal Mines Ltd.

The geology of the northern part of the anticlinal fold just east of Indian Mountain Lake has been mapped by W.W. Heywood (Geological Survey of Canada, Map 32-1963). He considers the volcanics and sediments involved in the folding to belong to the Yellowknife Group. The basic volcanics of the core of the fold grade upward, through intermediate, to acid volcanics (rhyolite) and the volcanics are overlain by limestone and this, in turn, by greywacke with interbedded argillaceous sediments. The rocks are in part, as in the vicinity of the BB deposit, quite strongly metamorphosed.

During 1965 work was conducted on these properties, and on a property optioned from Mrs. G. McAvoy (principally the DAWN and GEM claims), by International Mines Services Ltd. Geophysical surveys were conducted over all 355 claims of the properties held in the area. A total of 380 line miles of electromagnetic survey and 408 line miles of magnetic survey were carried out. In addition, some geophysical work was performed from the ice of some of the lakes late in the year.

Detailed geological mapping was performed on 6-claim and 10-claim areas near the southeast corner of Brislane Lake and south of BB Lake, respectively, on the property of Indian Mountain Metal Mines Ltd. On the Prima Base Metal Mines property geological mapping covered approximately 11 claims along the eastern contact of the fold structure and toward its northern end and approximately 6 claims in the southwest corner of the property near the western contact of

the structure. A large part, roughly 50 claims, of the Snowdrift Base Metal Mines property was also geologically mapped.

A total of 3,399 feet in 8 holes was drilled in testing some of the geophysical anomalies during the season. The drilling consisted of 2 holes on claims TREE 2 and TREE 46 of Prima Base Metal Mines Ltd., 4 holes on claims SOLO 51, 52 and 56 of Snowdrift Base Metal Mines Ltd., and 2 holes on claims MOON 41 and 43 of Indian Mountain Metal Mines Ltd. Traces of sphalerite and chalcopyrite mineralisation were encountered in some of the drill holes but nothing found to date has been of economic interest.

The geological mapping and other work of the 1965 season served, among other things, to call attention to the possible importance of the volcanics-sediments contact as an ore control. The exploration program, especially diamond drilling of the more important of the untested geophysical anomalies, will continue during 1966.

### East Arm of Great Slave Lake

Nahanni Mines Ltd. had a number of exploration crews working throughout the East Arm area of Great Slave Lake during the season. A number of claim groups were staked to cover showings of copper, silver and cobalt at various localities throughout the area. Geological mapping, trenching and sampling were done in an attempt to evaluate the showings. It will be noted from the following descriptions of individual claim groups that many of the occurrences are located near the Murky and McDonald Faults, regional faults which parallel the southeast shore of the East Arm. These major fault structures thus appear to be a controlling factor in the mineralization.

#### WOOEE Group

The WOOEE group of 8 claims (mineral claim sheet 75-I-11) is on a small island about 6 miles northeast of Taltheilei Narrows at Lat.  $62^{\circ}40'N.$  and Long.  $111^{\circ}24'W.$  These claims were recorded for Nahanni Mines Ltd. on October 4, 1965.

Disseminated chalcopyrite is present in quartz-carbonate veins which form a stockwork in a shear or breccia zone trending about  $N.40^{\circ}E.$  on claims WOOEE 3 and 4. The stockwork is in quartzite and massive sandstone of the Sosan Formation (Geological Survey of Canada, Map 377A) and the zone is along the northwest shore of the island. The sandstone dips at a low angle to the southeast and is overlain by a thin discontinuous shale (or slate) unit which, in turn, is capped by a relatively thick diabase sill that outcrops over most of the island. The mineralized zone is exposed for a length of about 1600 feet and passes into the lake at either end. The zone is thought to be related to a regional shear or breccia system to which a copper-cobalt showing at Taltheilei Narrows may also be related. Assays indicated 1.33% Cu over 5 feet in an old trench on WOOEE 3 and 1.35% Cu over 4 feet in a pit blasted on WOOEE 4. Detailed prospecting and trenching has been recommended for the property.

REG Group

The REG 1-19 claims (mineral claim sheet 75-L-8) are located on the south shore of Regina Bay of Stark Lake at approximately Lat. 62°25'N. and Long. 110° 21'W. These claims were staked by Nahanni Mines Ltd. in May, 1965.

A major northeasterly-trending fault crosses the property and is thought to be a continuation of Murky Fault. This fault separates red shale of the Kahochella Formation and sandstone of the Sosan Formation, which occupy the northwest half of the claim group, from younger dolomite and arenaceous rocks of the Pethel and Murky Formations. Acidic intrusive rocks ranging from granite to diorite are present toward the southeast corner of the property.

A considerable number of barite-bearing veins, in which bornite, chalcopyrite and galena are irregularly distributed, are present on claims REG 2, 3 and 6 in the northwest corner of the claim block at or near where minor faults subsidiary to Murky Fault cut a greenish-white sandstone unit in the uppermost part of the Sosan Formation. Some of the veins also occur in underlying red micaceous sandstone and in red shale of the overlying Kahochella Formation. The barite veins vary from a few inches to a foot in width and all occupy fault planes. None are considered to be of economic importance.

Within Pethel dolomite south of Murky Fault some chalcopyrite is present in quartz veins and disseminated in the country rock. The quartz veins are associated with intense folding and related faulting.

An occurrence of copper, cobalt, nickel and uranium mineralization is found in the eastern portion of the property. The mineralization occurs as very narrow veins in the quartz-diorite phase of the granite mass. Extensive trenching has been done over the showings by previous operators, but no resampling was done by Nahanni personnel.

HAR Group

The HAR group of 20 claims (mineral claim sheet 75-L-8) is located just north of Wilson Lake and just south of Stark Lake. This group of claims was recorded for Nahanni Mines Ltd. in March, 1965.

Top Showing. This showing is on claim HAR 14 and consists of a vein containing bornite, and minor chalcopyrite and chalcocite, in a fracture cutting granodiorite. The fracture trends N.70°W. and dips 75°N. and has been traced for 250 feet. The vein was investigated some years ago and the work included some small-diameter core drilling.

Fracture Showing. This showing is similar to the Top Showing, consisting of copper mineralization in a quartz-carbonate vein cutting granodiorite. The vein is near the eastern boundary of claim HAR 18.

Discovery Showing. This showing consists of copper mineralization in a shear zone that has been traced for 400 feet and cuts light-grey-green dolomite and siltstone of the Pethei (?) Formation near the contact of these sediments with granodiorite. Some mineralization is also present in isolated bands and disseminated throughout the surrounding rock. The most common mineral appears to be bornite. Domeykite and at least one other copper arsenide mineral are also present and some cuprite has been produced by weathering.

Seven trenches have been excavated along the showing. Trench 7 is the most northeasterly of these and samples indicated 0.51% Cu over 8 feet. Trench 6 is 100 feet to the west and gave 0.46, 0.99 and 0.85% Cu over contiguous widths of 5, 3 and 5 feet. Trench 5 is 40 feet south of trench 6 and gave 0.57, 0.71 and 0.99% Cu over adjacent widths of 6, 7 and 8.5 feet. The other trenches failed to give significant assays with the exception of trench 1, about 270 feet south of trench 5, which gave 0.92% Cu and 14.46 oz. Ag over a width of 6 feet. Other silver assays are generally of the order of 1 oz. at best. Chip sampling of two trenches by the Nahanni consulting geologist during September, 1965, returned values of 0.42% cobalt and 0.52% cobalt, both across 5.0 feet.

Some investigation of the showing by geophysical methods, either an electromagnetic or induced polarization survey, has been recommended.

#### MARK Group

The MARK group of 28 claims (mineral claim sheet 75-K-12) lies north of McAteer Lake and south of Kinsey Lake at a point about 17 miles southwest of



Reliance. The group was recorded in July with the exception of a single claim added in August.

A major regional fault, believed to be an extension of Murky Fault, crosses the claim group and forms the north boundary to the area in which mineralization of interest occurs. The low grade copper mineralization consists predominantly of chalcopyrite disseminated in quartz-carbonate stringers in fracture zones, or breccia zones along secondary faults, in dolomite of the Pethei Formation. Siderite, although not abundant, is a relatively common constituent of the veins and minor bornite was observed in a few showings.

Small bodies of rhyolite occur along some of the important faults on the group and are interpreted as intrusive in nature. The rhyolite is spatially, and perhaps also genetically, associated with granite and may have formed at the same stage as the quartz-carbonate veins and copper mineralization.

Mineralization, while widespread, is not concentrated. In many cases mineralized zones have been traced to where they disappear under swamp.

The Alpha Zone is located on claims MARK 1 and 2 approximately 1000 feet north of the south boundary of the group. The Beta Zone is 500 feet to the north of the Alpha Zone on claims MARK 7 and 8 near their southern boundaries. The Cryptic Zone is 1200 feet farther north and extends east-west across the northern parts of claims MARK 7 and 8. The Delta Zone is west and somewhat north of the Cryptic Zone, largely on claim MARK 14 but extending south onto claim MARK 9.

Results of initial sampling of trenches on the property have indicated low values in copper. In the Delta Zone values of 0.48% Cu and 0.43% Cu over good widths of 34 ft. and 38 ft. were obtained along a subsidiary fault lying about 300 feet southeast of and paralleling Murky Fault. In this area an assay of 1.30% Cu was obtained over a width of 10 feet. One trench in the Alpha Zone gave an average assay of about 0.5% Cu over a width of 29 feet.

The Company's consultant has recommended an induced polarization survey to outline the disseminated copper mineralization found on this group.

### POLO Group

The POLO Group of 30 claims was recorded in July, 1965, and is located on the north-central shore of Meridian Lake (mineral claim sheet 75-K-11) between the DAK group of claims on the west and the ANN group on the east. The group lies along the fault contact between red shale, and an interbedded shale-dolomite sequence, of the Kahochella Formation and grey dolomite, with interbedded limestone, of the Pethei Formation. This fault is considered to be an extension of Murky Fault.

Occurrences of disseminated chalcopyrite and minor bornite in silicified dolomite and quartz-carbonate stockworks are similar to those on the adjacent ANN group (Baragar, 1961). Only relatively low copper values were obtained as a result of the season's work.

### GEM Group

The GEM group of 28 claims (mineral claim sheet 75-K-11) lies on Maufelly Point just west of Reliance. The group is a restaking of part of the ANN group and adjoins ANN 8 and 9 to the west and the AZA group to the east. The GEM group was recorded in July, 1965, and 3 claims were added in September.

The rocks on Maufelly Point consist of red shale and siltstone, and a thinner dark grey to black shale unit, all of the Kahochella Formation, which are overlain by laminated red or hematitic dolomite of the Pethei Formation.

The rocks are strongly faulted. Two major faults, probably part of the same system, pass through the property and a great number of subsidiary faults are found between them. Folding, especially in the red shale and siltstone, is prevalent and confusing and thus much of the rock is badly deformed.

Copper mineralization consists of chalcopyrite which is always associated with and controlled by the faults. Chalcopyrite is present in narrow veins, in large breccia bodies, and disseminated in silicified dolomite. Three main showings have been investigated in detail.

Showing No. 1. This showing occurs in dolomite south of a major fault contact with red shale on claim GEM 13. Chalcopyrite is disseminated in silicified and weakly brecciated dolomite and the better grade sections are highly siliceous lenses within more extensive areas of silicification. The best section gave an assay of 0.84% Cu over 10 feet.

Showing No. 2 (Shore Showing). This is the principal showing and is located on the north shore of Maufelly Point along the northern boundary of claim GEM 2. Chalcopyrite occurs as disseminations in silicified tan coloured dolomite, as blebs and fracture fillings in brecciated red and black shale, and as massive veins and heavy disseminations in red siltstone. The mineralization has been traced for a length of 1350 feet and the zone passes under beach gravels and the lake to the northeast and swampy ground, and thence the lake again, to the southwest. The mineralized area, as far as it is exposed, is bounded by two pronounced faults, both of which may be local branches of the major fault located just offshore to the north. No copper mineralization has been found in the immediate vicinity outside of this fault block. This fault system continues onto the adjacent AZA group to the east where Chesterville Mines Ltd. have drilled for copper in the past.

The best section within the mineralized zone has been traced for a length of 175 feet and gave 1.89% Cu across 14 feet at the southwest end (Trench No. 1) and 1.60% Cu across 24 feet at the northeast end (Trench No.3) where the mineralization is in silicified red shale which forms a low outcrop on the beach. Trench No. 4 is located 250 feet southwest of Trench No. 1 and gave 1.50% Cu over a width of 10 feet.

Showing No. 3. This showing is located near the center of claim GEM 16. Chalcopyrite occurs as disseminations and narrow gash veins in grey dolomite that is locally silicified. The best assay obtained was 1.01% Cu over a width of 10 feet.

An electromagnetic or induced polarization geophysical survey has been recommended for the winter to determine the extent of Showing No. 2 beneath Maufelly Bay.

### CUD Group

The CUD group of 7 claims (mineral claim sheet 75-L-4) is located adjacent to the McDonald Fault about 50 miles southwest of the REG Group. This group was staked during September, 1965.

The copper mineralization consists of finely disseminated chalcopyrite in altered basic volcanics which appear to form a large inclusion in white pegmatitic granite. The best character sample returned 1.7% Cu. This showing does not appear to hold too much promise.

### BUN Claims, Thubun Lake

The BUN claims are, in part, a re-staking of the DIK group which has been described by Baragar and Hornbrook (1963, p.22). Additional claims were staked during the year and the property consists of 79 BUN claims and 12 adjoining PEP claims. The property was transferred by Frank Avery, the owner, to a newly formed company, First Northern Exploration, which granted an option to Rolling Hills Copper Mines Limited.

The metamorphosed sedimentary rocks on the property strike northeast-southwest and dip approximately 40° N.W. The sediments are largely greywacke and marble, with narrow beds of good quartzite. These rocks have been intruded by granite, aplite and pegmatite.

In places sphalerite has partially replaced beds of limestone or marble. Where mineralization is present the carbonate rock has been altered to calcsilicate minerals, chiefly coarse diopside. Some chalcopyrite and minor galena are also disseminated through the metamorphosed sediments. From surface exposures it appears that chalcopyrite is most abundant in the greywacke.

SULPHUR BAY AREA

The Consolidated Mining and Smelting Company and Elgin Petroleum Corporation were both active in this area and both companies conducted drill programs.

Elgin Petroleum Corporation (85-G-5)

Work was performed for this company, a wholly owned subsidiary of Rayrock Mines, by Precambrian Mining Services Ltd. Work in the area was initiated for Rayrock Mines in March, 1964, and during the 1964 season detailed geological mapping and rock and soil geochemical surveys were carried out. The IIP (63 claims) and IOT (35 claims) groups were recorded in September 1964. The claims cover a large part of the outcrop area of the Presqu'ile reef on the south shore of Windy Bay.

The 1965 program consisted of an induced polarization survey of the IIP and IOT groups and the drilling of 24 diamond drill holes totalling 4,995 feet. Anomaly A on the IOT group, in the southern part of claim IOT 2 and extending onto claims IOT 1, IOT 9 and IOT 10, was tested by 16 holes, most of which were to a depth of about 200 feet. Anomaly B toward the northeast corner of claim IOT 2 was tested by a single hole. On the IIP group 5 holes tested the A anomaly in the vicinity of the junction of claims IIP 1, IIP 10 and IIP 44 and 2 holes tested the B anomaly near the shore of Windy Bay and at the boundary of claims IIP 2 and IIP 48. The A anomaly on the IIP claims was displaced a relatively short distance, 200 to 400 feet, to the west of peaks of both soil and rock geochemical anomalies. The drilling indicated considerable oil staining in the reef dolomite of the Presqu'ile Formation, but only scattered traces of sphalerite and galena mineralization. Some finely disseminated marcasite was present in some of the underlying Pine Point limestone. Forty-three IIPA claims (85-G-5, 85-F-8) were recorded in August but no work was performed on these claims.

The Consolidated Mining and Smelting Company (85-G-5,12, 85-F-8)

Over 350 claims (PIP group) were staked by the company in 1964 and are currently held in the area. The claims in part lie south of the Elgin Petroleum Corporation property but also extend in a belt to the north along the east side of Prairie Lake. An induced polarization survey of a block of 63 claims lying just east and southeast of the south end of Prairie Lake was carried out during October and November, 1964. This survey consisted of 41 line miles of reconnaissance work and 24 line miles of detailing.

Detailed geological mapping was carried out during the 1965 season in the area covered by the induced polarization survey and extending north of this along the east side of Prairie Lake to a point 2 miles north of the north end of the lake. A total of 3,941 feet was drilled in 20 holes. A series of 10 diamond drill holes tested 2 anomalies east of the south end of Prairie Lake, 2 holes were drilled (claims PIP 266, 267) near the south edge of Goose Point between Sulphur Bay and Windy Bay, and 8 holes were located south of the property of Elgin Petroleum Corporation. Four of the latter holes were along a line extending south from the south corner of the Elgin Petroleum Corporation property and closely correspond, in location, to the previous series of holes along line G to J as shown on the geological map by Norris (1965).

PINE POINT AREA

Relatively few companies held property in the Pine Point area at the beginning of the year but the number had increased tremendously by the end of the year. Staking completely surrounded the Pine Point Mines property and then expanded to cover most of the area between the Little Buffalo and Buffalo Rivers and extending south from the shore of Great Slave Lake to the boundary of Wood Buffalo Park. Pyramid Mining Company announced discovery of a large lead-zinc deposit at the beginning of November.

Conwest Exploration Company Limited

During the year Conwest Exploration Company acquired Newconex Canadian Exploration Limited as a partner in all exploration activities in the Pine Point area. The financing of exploration under the management of Conwest is thus Newconex 50%; Conwest 40% and Central Patricia Gold Mines 10%. Huntec Limited carried out induced polarization surveys over 569 of the claims held in the area. The areas covered by geophysical surveys are located on mineral claim sheets 85-B-10, 11, 14, 15 and 16 and comprise the following claims:

Area 1	AM	1-50
	TV	83-108
Area 2	IP	1-101, 110,111,116,117,122,123,128,129,217
Area 3	TH	1-150
	GEX	3,4, 8-10, 15-17, 20-22, 27-29, 32-34, 46-48, 53-55, 62-64, 69-71, 78-80, 87-145, 151-160
Area 4	TV	1-82, 109-158

The induced polarization surveys were conducted on lines spaced at 1000 feet intervals except for claims TV 1-82, 109-158, where the spacing was usually 800 feet. Lines about 250 feet apart were used for detailing of anomalous areas. A total of 251.54 line miles of reconnaissance survey and 39.14 line miles of detail survey were carried out. The reconnaissance work resulted in a total of 19 anomalies of possible significance. Detailed

induced polarization surveys were carried out over 15 of these anomalies. Two anomalies on Area 3, just west of the Buffalo River, were tested by diamond drilling. One of these anomalies, located on claim TH 31 was tested by 3 holes and the second anomaly, on claim TH 34, by 2 holes. The results of the diamond drilling were negative.

Seven anomalies were located on the TV claims of Area 4. These claims are bounded on the north, west and south by the Pine Point Mines property. Of these anomalies one, in particular, is considered a favourable target. This anomaly is located on claim TV 113, approximately 4 miles northwest of the town of Pine Point.

#### Pyramid Mining Company

The property of the Pyramid Mining Company lies immediately south of the property of Pine Point Mines. Most of the claims were recorded during July and August, 1965. An induced polarization survey was started about the beginning of September. The geophysical work resulted in two principal anomalies. The largest of these anomalies was about 1500 feet long by 800 feet wide and was tested by drilling in October. The company reported on November 2nd that the first drill hole had intersected 62 feet of ore-grade lead-zinc mineralization. By the beginning of December a hole had been drilled to test the No. 2 anomaly and had intersected 37 feet of good grade ore. In mid-December it was estimated that drilling of the No. 1 deposit had indicated 4,000,000 tons of ore with a grade of 15% combined lead-zinc. The company is continuing a vigorous drilling program to evaluate the two deposits. The Newconex-Conwest partnership provided financing for the drill program through a stock purchase and option agreement.

The ore in the No. 1 deposit seems to be generally of very constant character. The nearly massive sulphide ore consists of prominent marcasite together with sphalerite and galena and perhaps 5% vein calcite. The marcasite in large part appears to have been brecciated and then cemented by sphalerite



and galena. Sphalerite, galena, and even marcasite are often seen to be quite coarsely crystalline where later calcite stringers transect the ore. The sphalerite in part shows good colloform structures. The ore has a quite constant ratio of zinc to lead at about 4:1. The country rock appears to be entirely dolomite. In general the dolomite is finely to coarsely granular and a medium gray to buff color. Some of the dolomite is very light gray in color and aphanitic. In part the dolomite is slightly vuggy but only very rarely are thin beds comparable to the Presqu'ile encountered. Some beds of fine grained dolomite that has been brecciated are also present and one such horizon just below the ore in several of the holes may prove to have some continuity. It appears that the Pyramid deposits are not in reef material but possibly in rocks which are time-stratigraphic equivalents of the Presqu'ile Formation. In this view the highly vuggy rock of the reef would interfinger to the south with the sandy textured and aphanitic dolomite of the Pyramid core.

#### Other Pine Point Area Properties

The DIAMOND 7 group was staked in 1957 and the EV group in 1961. The claims were acquired by Patricia Silver Mines from J. R. Woolgar and associates of Yellowknife. Early diamond drilling for assessment purposes on the DIAMOND 7 group consisted of 2 holes on Claim 9, 5 on Claim 10 (3 to bedrock), 2 on Claim 17 (1 to bedrock) and 14, of which two were abandoned in overburden, on Claim 18. Of the 18 holes which reached bedrock, at an average depth of nearly 100 feet, all except one were drilled only about 2 or 3 feet in solid rock; the one hole was drilled 27 feet in bedrock before drilling was stopped. Included in the above drilling is a series of 8 holes drilled from a small lake on Claim 18 during January, 1961. In this drilling traces of galena and sphalerite were encountered in 2 holes, and of galena alone in an additional 3 holes. Later drilling, recorded in November, 1964, consisted of 11 holes on Claim 17 and 10 holes on Claim 18. From 52 to 92 feet were cored in bedrock in each hole in this drilling program. The core from 10 of the holes on Claim

17 and 4 of the holes on Claim 18 showed traces of galena, generally with minor associated sphalerite and pyrite (marcasite ?). As noted by Schiller (Paper 65-11, p.31) this drilling indicates that rock of Presqu'ile type is present immediately below the overburden in at least part of this area. The rock resembles the Presqu'ile in its highly vuggy character, the partial recrystallization of the rock, and the presence of minor amounts of tar and sulphide minerals. However, the rock has been logged as limestone rather than dolomite and from its location must belong to the Slave Point Formation.

On the EV group the drilling, 17 holes, has been restricted to Claim 16. The first 6 holes, 4 to bedrock, were similar to the early holes on the DIAMOND 7 group and indicated about 100 feet of overburden. Eleven holes, recorded in November, 1964, were drilled to an average depth of about 175 feet and had an average core length of about 90 feet. At least traces of galena, mostly with associated sphalerite, are recorded in 6 of these holes. Coarse to massive galena is recorded over 7 feet in one hole and coarse to massive galena and sphalerite over 3 feet (hole inclined at  $45^{\circ}$ ) in another. In the latter hole mineralization is, in fact, recorded from where the hole entered bedrock to 156 feet core length, below which no core was recovered. Some copper, in addition to sphalerite, galena and pyrite, is recorded for a 46-foot section of the core. Minor copper staining is reported from two other holes on this group and from two holes on the DIAMOND 7 group.

Work by Patricia Silver Mines on the DIAMOND 7 and EV groups consisted of an induced polarization survey. This survey resulted in an anomaly about 2,500 feet long by 600 feet wide near the center of the property. It is planned to drill this anomaly during January.

BORNITE LAKE

Four Copper Lamb claims were recorded by Glen Rapson and Thomas Lamb during July, 1965, to cover some of the most spectacular of the bornite showings just north of Bornite Lake (mineral claim sheet 86-N-10). The claims are a restaking of part of the B group of claims; Lord (1951,p.77) gives a description of the property prepared by D.F.Kidd. Fairly massive bornite over widths up to 12 feet has been exposed by trenching. If the main vein is along a 250-foot section which has previously been investigated by four trenches, a grade of approximately 40% copper over an average width of 8.8 feet is indicated.

A brief visit was made to the property on July 28th. The main showings near the center of the 4-claim group were not examined. Fairly massive bornite is exposed as large boulders, apparently essentially in place, in a trench at the northwest corner of claim Copper Lamb No. 4. The boulders indicate a vein width of 3 to 4 feet. About 300 feet to the south the vein has a width of 1 foot and consists of pink and white calcite spotted with chalcocite and some bornite.

Somewhat south and just west of the center of the claim group a zone has been trenched which shows some quartz, jasper, calcite, dolomite, bornite and minor chalcocite. Just east of this there is a width of 15 feet of massive white quartz with minor bornite and, especially toward the eastern edge of the zone, considerable iron-bearing carbonate, either dolomite or siderite.

During 1966 the firm of Watts, Griffis and McQuat Limited of Toronto will supervise a diamond drilling program on the property for Consolidated Proprietary Mines Holdings Limited.

CORONATION GULF AREA

James River Mines Limited

A description of the claim groups (mineral claim sheet 76-M-11) held by this company, the general geology of the area and the exploration work conducted during the 1964 season has been given by Schiller (1965). The crew at work in the area during the 1965 season consisted of 4 prospectors, 2 plugger operators, an engineer-sampler, 4 assistants and 2 Eskimo helpers. Trenching and sampling of the main veins on the Sidewalk group, in particular the best sections of the North and East Boundary veins, was carried out. Work on the FG group consisted mostly of prospecting with an attempt at assessment of some of the veins. An area was prospected along Coronation Gulf extending to a point 25 miles west of Tree River and south from the coast to the falls on Tree River. Quartz veins in the area are strikingly continuous along strike and are up to 5 feet and rarely as much as 20 feet, in width. Gold values are often concentrated with sulphides, most commonly pyrite, in the shattered walls of the quartz veins over restricted widths of up to  $1\frac{1}{2}$  or 2 feet.

Sidewalk Group A total of 146 trenches at intervals of 25 to 50 feet were blasted into the North, East Boundary, Diane, Bobby and nearby veins. From these trenches 408 chip-channel samples were cut and assays obtained. The distribution of trenches and samples are listed below. Over 66% of the samples representing over 74% of the footage sampled contained negligible gold values. Only 4% of the samples gave assays of 0.75 oz. Au per ton or better. The surface work failed to define a single shoot of ore grade.

<u>Vein</u>	<u>Number of Trenches</u>	<u>Number of samples</u>
Bobby Vein and offshoots	24	42
Diane Vein	11	24
North Vein	66	214
Down's Vein	17	21
East Boundary Vein	21	93

<u>Vein</u>	<u>Number of Trenches</u>	<u>Number of samples</u>
Don Vein	2	21
E.-W. Vein	1	1
Jack Vein	4	9

The North Vein is exposed for about 730 feet northeastward from the No. 1 post of claim N 50033 across claim N 50042. In this section assays on samples taken by Precambrian Mining Services during the 1964 season appeared to indicate that the northern 400-foot section of the vein averages 0.30 oz. Au/ton over a width of about 7 feet. After a gap of 1550 feet in which there is no exposure the vein outcrops again on claim N 50041. The vein here is exposed for a length of 400 feet to near the boundary with the property of Consolidated Manitoba Mines. Sampling by Precambrian Mining Services over a trenched length of 320 feet gave an average grade of about 0.84 oz. Au/ton over a width of 5 feet. Sampling by James River Mines during the 1965 season resulted in some discrepancy in values and a lower average grade. Resampling by Precambrian Mining Services generally confirmed the lower grade. After a break of about 430 feet the vein is exposed on the Consolidated Manitoba Mines property for 160 feet and then continues onto the property of McIntyre Porcupine Mines Limited.

Sampling on the East Boundary vein also outlined a length of about 300 feet over which erratic and sometimes high values were obtained.

FG Group In addition to the previously known discovery vein on claim N 36195, the JoJo and Slant Veins were located during the 1965 season. Other veins on the claim group include the Banana (claim N 36197), LuLu (claim N 36207) and BooBoo (claims N 36216-7).

The BLOOD, JACK and JOE claim groups were recorded during July. The BLOOD group (40 claims) lies east of, and the JACK group (39 claims) north of, the FG group. The JOE group of 100 claims (mineral claim sheet 76-M-12) lies west of the Sidewalk group and just southwest of Caribou Bay.

Consolidated Manitoba Mines Limited

Precambrian Mining Services conducted an intensive surface evaluation of the H group of 50 claims (mineral claim sheet 76-M-11) for Consolidated Manitoba Mines Limited. The work consisted primarily of trenching at 25 foot intervals along exposed portions of the gold-bearing quartz veins.

The short section of the North Vein which is present on the northwest corner of the Consolidated Manitoba Mines property has been trenched southward from the McIntyre Porcupine Mines boundary to where it is covered by deep overburden in a stream valley. Part of this section of the vein is well mineralized with very light coloured pyrite, the major gold-bearing mineral in the veins. A grade of 0.48 oz. Au/ton across a width of 4 feet was indicated by 4 trenches along the exposed length of 160 feet.

The greatest amount of trenching was done on the No. 1 Vein on the north half of the H group. This zone of quartz veining extends S 15° E from the north central part of the property and its south end, on claim H 15, swings to a trend just west of south. The quartz veins along this zone are generally parallel, perhaps in part in an echelon arrangement, and their dips range from vertical to 65° east. In places the zone is represented by a shear zone without any quartz veins. Mineralized portions of the quartz veins are generally not more than 2 to 4 feet in width. Pyrite is the chief sulphide mineral, but along some sections of the vein chalcopyrite is fairly common. The vein has been traced for a length of 5,000 to 6,000 feet and along certain sections sampling has indicated a grade of 0.40 oz Au/ton across an average width of 4.0 feet. One shoot 250 feet long grading 0.69 oz. across 4.0 feet and another a little longer and grading 0.73 oz. across 3.3 feet have been outlined.

The No. 3 Vein occurs on the southern half of the H group of claims. The vein strikes approximately N 35° E and has been investigated by trenching on claims H 18, 19, 29 and 30. The vein has reportedly been traced for a length of 6,000 but work to date has been on 8 zones, A to H, over a length of about 4,000 feet. The H zone has not yet been fully tested by trenching.

The following results have been obtained by the surface sampling:

<u>Zone</u>	<u>Length (ft.)</u>	<u>Width (ft.)</u>	<u>Grade (oz./ton)</u>
A	250	4.0	0.67
B	230	2.4	0.44
D	200	4.0	0.52
E	280	3.8	0.46
G	280	4.4	0.93

The average grade for these five zones, representing a length of 1,240 feet out of a strike length of about 2,500 feet, is 0.64 oz. Au/ton across 3.7 feet.

The MAN group of 18 claims was staked south of the H group to cover the southwestward extension of No. 3 Vein. These claims were recorded in September. Work recommended for the 1966 season includes additional trenching on the southern part of the H group and on the MAN group, geological-structural mapping of the vein systems and diamond drilling of the No. 3 and North Veins, and possibly of the most interesting sections of the No. 1 Vein.

McIntyre Porcupine Mines Limited

Work by this company was largely concentrated on the G group of 32 claims (mineral claim sheet 76-M-11). The work consisted chiefly of trenching, at 50 foot intervals, for purposes of examination and sampling, those sections of known and newly discovered gold-bearing veins which appeared of interest. A total of 95 trenches were excavated. Most of the veins belong to a single set with strikes of about N 30° E and nearly vertical dips. The veins cut pink and grey granitic or granodioritic orthogneiss.

No. 10 Vein. This vein is located toward the northwest corner of claim G 14. As for other veins in the area, gold values are only obtained where sulphides are present and the predominant sulphide is light-coloured pyrite. The vein has a general width of 3 to 3½ feet and a grab sample from the vein reportedly gave an assay of 1 oz. Au.

No. 9 Vein. This vein is located near the northern boundary of claim G 22. The vein is about 1½ feet wide, has a strike of 25° and is approximately vertical. The vein contains some pyrite and also minor chalcopyrite.

Flat Vein. The Flat Vein is located southeast of the No. 9 vein and just northeast of the Sphalerite Vein. The vein is 1½ feet wide and contains considerable pyrite as streaks parallel to the vein walls. The most pyrite-rich sections give good assays.

Sphalerite Vein. This vein is located near the center of claim G 22. The vein actually consists of narrow quartz stringers which occupy a definite shear zone in pink orthogneiss. The maximum width of quartz observed was 1 foot. Locally the vein is well mineralized with either sphalerite or pyrite.

Discovery Vein. This vein lies 300 feet east of and approximately parallel to the Sphalerite Vein; the strike of the vein is about 30° and the dip is steep to the east. The vein contains seams of very massive pyrite and also minor galena mineralization. Channel samples over widths of 3 feet gave assays of 0.5 oz. Au.

Pick Vein. This vein is located on claim G 23 where it is exposed on the eastern part of the claim and again on the south boundary. The vein strikes N 30° E and has been traced over a length of at least 1750 feet. Pyrite mineral-



ization is appreciable and the vein in general has a width of about 2 feet. Galena is rarely present in the southern of the two exposed sections of the vein.

North Vein This vein has been traced for 1200 feet on the McIntyre property (Claim G 32). Trenching work during the 1964 season indicated a grade of 0.4 oz.Au/ton over a width of  $4\frac{1}{2}$  feet. During the 1965 season the vein has been trenched at 50 foot intervals to the boundary with Consolidated Manitoba Mines Limited. The vein in places pinches out and is simply represented by a shear zone, but in general it is from 1 foot to a maximum of 8 or 10 feet wide. Toward the north end the vein consists of quartz mixed with red aplite over a width of 6 feet and shearing is particularly evident along the west wall. The vein here is approximately vertical. Near the boundary with Consolidated Manitoba Mines pyrite is fairly abundant over part of the width of the vein. The vein also carries minor galena and chalcopyrite. The 1200 feet of the north vein on McIntyre ground averaged 0.33 oz.Au/ton over a width of 5.0 feet. A 350 foot section of this 1200 feet averaged 0.474 oz.Au/ton over a width of 7.2 feet.

No. 11 Vein This vein is located 1200 feet northeasterly on strike from the north vein and is exposed by three trenches. A sample over 1.0 feet of the best pyrite mineralization assayed 4.76 oz. Au/ton.

West Vein This vein is located 1400 feet northwest from the No. 11 vein and consists of intermittent narrow quartz veins up to 1.0 feet wide along a length of 1000 feet. This is the only vein in which visible gold was noted.

Bathurst Inlet Area

Roberts Mining Company maintained camps at Turner Lake (North latitude  $67^{\circ} 12'$ , West longitude  $108^{\circ} 45'$ ) and on the Hood River near Pistol Lake during part of the exploration season. Some trenching on the gold showings at Turner Lake on the CCI group of claims and near Pistol Lake on the NOEL group (Schiller, 1965, p.9), and some prospecting in the area, was carried out over the breakup period. Prospecting Permit areas 76-N-2, 76-N-6 and 76-K-14 have now lapsed or been dropped by the company.

A limited diamond drilling program was carried out on the Pistol Lake property (approximately North latitude  $67^{\circ} 03'$ , West longitude  $108^{\circ} 47'$ ). The gold bearing zones here are in a N.N.W. striking series of quartz-rich highly metamorphosed sedimentary rocks of the Yellowknife Group (Fraser, 1964). The rocks are largely quartz-biotite gneiss but some bands might be considered quartzite and some are garnet-and amphibole-bearing. Although there is small-scale fluctuation in the attitude of the layering the dips are generally  $45^{\circ}$  to  $55^{\circ}$  to the southwest. Small scale dragfolds pitch approximately  $30^{\circ}$  southwest.

Some trenching was done on the property during 1964 (Schiller, 1965, p.10). The main showing was first exposed in trenches in rust-stained rocks along the south edge of a small valley extending west from the Hood River. A section was exposed here which assayed 0.5 oz. Au/ton over a width of a few feet. The most interesting zone was to the east of this but was covered with rubble and likewise the southerly extension of the zone was not exposed. This zone was investigated by a series of three drill holes, drilled at 300 foot intervals along an east-west line. The holes were inclined at  $45^{\circ}$  to the northeast, approximately perpendicular to bedding. The two most easterly holes each intersected two zones about 5 feet wide, most likely representing three independent zones, which gave good gold values. One intersection returned an average assay of 1.77 oz. Au/ton. The zones which are gold-bearing contain much vein quartz, and some arsenopyrite and pyrrhotite (sometimes as massive

bands a number of inches wide), but as ramifying veinlets and irregular masses rather than as single well-defined veins.

The drill is stored on the property and drilling is planned during the 1966 season to determine the extension of the zone along strike and down dip.

The gold showing at Turner Lake has been briefly described by Schiller (1965, p.9). During 1965, a considerable program of trenching and sampling was carried out. Some moderate gold assays were obtained and visible gold was noted in several samples, but the distribution of gold seems generally to be erratic. Two diamond drill holes totalling 540 feet failed to intersect anything of interest.

## Hope Bay Area

Archie Talbot and Ingi Bjornson, working for Roberts Mining Company, discovered several gold and copper showings in the Hope Bay area in the fall of 1964. Twenty-four APA claims (mineral claim sheet 77-A-3) were staked to cover the showings. Noel Avadluk prospected in the area over the winter and located a number of other showings. Work during the 1965 season consisted of general prospecting and trenching of showings. Claims CAR 15-30 were recorded in September and adjoin the APA 1-20 group.

The main showings which have been investigated to date are as follows:

### Discovery Showing

This showing is located on claims APA 5 and 6 near their common boundary and is in one of a number of very prominent shear zones which cut volcanic rocks in the immediate area. The shearing, with local deviations, generally strikes NNE to NE and the zone has been traced over a length of about 2000 feet. Irregular areas of the sheared volcanic rocks are now rust-stained or "oxidized". Some siderite is evident in the sheared rock in places but whether this accounts for the distribution of "oxidized" areas is uncertain.

In one trench across part of the wide shear zone two bands of quartz 1 to 1½ feet wide are exposed. This quartz is quite heavily mineralized with arsenopyrite and elsewhere along the zone similar blocks have been pushed up by frost action. In some cases coarse pyrite is associated with the arsenopyrite. In one trench on the showing a quartz vein 14 inches wide assayed 0.34 oz. Au/ton and an adjacent width of 27 inches of sheared rock assayed 0.18 oz.

### Angie Showing

This showing is located on claim CAR 22 and extends north nearly to the shore of Hope Bay. The showing is along the contact of dacitic or andesitic volcanic rocks on the west with black slate on the east and can be traced for a strike length of 750 feet. Pyrite, dolomite or siderite, sphalerite, galena, chalcopyrite and pyrrhotite are present in the quartz veins. A quartz vein 1 to 2 inches wide in the volcanic rock contains fairly abundant pyrite and

bournonite, and boulangerite is present in a quartz vein near the north end of the showing. Assays on grab samples of the mineralized quartz veins indicate that gold is low but that some silver is present. The following results are typical:

<u>Ag(oz.)</u>	<u>Au(oz.)</u>	<u>Cu(%)</u>	<u>Zn(%)</u>
2.34	0.06	0.14	2.51
3.04	0.06	0.32	-
6.50	0.03	0.23	-

#### Noel Showing

This showing is on the east shore of the southern tip of Hope Bay on claim CAR 25. The showing consists of a shear zone with a strike of about N 20° E which cuts dacitic to andesitic volcanics. Shearing can be noted over a width of about 100 feet, although the most intensely sheared portion has a width of only a few feet. Arsenopyrite needles form the bulk of the mineralization. Some quartz and siderite have also been introduced into the shear zone. The mineralized section has been traced for a length of about 200 feet. Grab samples with a high sulphide content gave the following results:

<u>Au (oz./ton)</u>	<u>Ag (oz./ton)</u>
.78	.75
.60	1.94
.26	.04
.37	.32

All assays on chip samples from trenches on the showing were considerably lower.

PRODUCING AND DEVELOPING MINES

Echo Bay Mines Limited

Echo Bay Mines is located 1 mile northeast of Port Radium on Great Bear Lake. The mill and housing facilities of Eldorado Mining and Refining Company Limited, a former uranium producer at Port Radium, are being used by the mine. Production was commenced in October, 1964, and milling was at a daily rate of about 85 tons at the end of the year. A production rate in excess of 100 tons per day was achieved during the final 6 months of 1965.

During 1965 production was 35,609 tons of ore, for an average daily rate of 97½ tons, which yielded 1,408,246 ounces of silver. The average grade of ore was 39.5 ounces per ton. The quarterly production figures for the year are as follows:

	<u>Tons Milled</u>	<u>Daily Rate</u>	<u>Grade (oz. Ag/ton)</u>	<u>Est. Production (oz. silver)</u>
1st. Quarter	7721	86	34.3	264,915
2nd. Quarter	8738	96	33.2	289,645
3rd. Quarter	9664	105	38.2	369,779
4th. Quarter	9486	103	51.0	483,907

In addition to a silver-copper flotation concentrate, a jig silver concentrate is also produced. The following figures, for those months for which data are available, will give an idea of the relative amounts of silver in the two concentrates and of the total copper production.

	<u>Tons Milled</u>	<u>Tons of Ag-Cu Concentrate</u>	<u>Ag in Ag-Cu Concentrate</u>	<u>Cu (lbs.)</u>	<u>Tons of Ag Concentrate</u>	<u>Ag in Ag Concentrate</u>
March 1965	2483	240	64,000	107,000	13.8	25,600
April 1965	2785	312	52,560	76,930	19.5	33,894
May 1965	2770	247	46,380	103,520	18.5	25,315
June 1965	3075	285	83,000	112,411	14.7	44,964
July 1965	3297	327	111,030	125,946	17.3	48,825
August 1965	3237	330	81,129	126,032	12.4	30,417
Sept. 1965	3130	292	33,508	104,768	14.2	68,071
Oct. 1965	3150	286	110,933	101,975	16.4	69,553
Nov. 1965	3165	308	94,395	119,856	18.7	74,477
Dec. 1965	3171	332	69,709	122,001	17.9	64,840

About one-third of the silver concentrate is flown out from the property while transportation of the silver-copper concentrate and the balance of the silver concentrate is by truck in winter and by barge in summer. The following is a record of shipments from the property.

	<u>Tons of Ag-Cu Concentrate</u>	<u>Ag in Ag-Cu Concentrate</u>	<u>Cu(lbs.)</u>	<u>Tons of Ag Concentrate</u>	<u>Ag in Ag Concentrate</u>
March 1965	116.5	60,850	48,500	20.1	64,700
April 1965	290	125,437	110,646	-	-
May 1965	76	17,623	30,500	11.5	23,000
June 1965	-	-	-	7.27	17,565
July 1965	1186.1	283,926	471,830	46.45	91,460
August 1965	296	69,588	106,657	8.5	24,134
Sept. 1965	595	139,919	213,437	28.1	67,461
Oct. 1965	-	-	-	3.4	17,700
Nov. 1965	-	-	-	4.8	17,824
Dec. 1965	-	-	-	6.5	28,436

Previous mine development has been outlined by Schiller and Hornbrook (1965, pp.16-19) and Schiller (1965, p.43). The mine is developed by two adits which are about 200 feet apart in elevation and are joined by a vertical raise at their intersections with the No. 2 Vein. At the lower adit level (at an arbitrary elevation of 625 feet) the 202 drift follows the No. 2 Vein in a direction S 30° W to a point approximately 820 feet from the adit where it diverges to a S 52° W direction. At the end of 1965 the drift extended west about 900 feet from this point, an advance of perhaps 200 feet over 1964. During 1965 mining was largely within this S 52° W section and between the elevations of the two adits. The 202-6-1, 202-6-3, and 202-8-1 stopes in this area, from northeast to southwest, provided much of the ore. Raises from the 6-1 and 8-1 areas were extended to surface to provide access to the upper part of the workings. The 203 drift lies about 50 feet southeast of and parallel to the 202 drift along the 6-1 and 6-3 stope areas. The 203A stope was established on a sub-level about 135 feet above the 203 drift. The veins being mined are considered to be the No.2 and No.3 veins. It seems questionable, however, whether the identity of these veins can be traced through the sudden change in direction noted above. From just west of the 202-8-1 stope area a crosscut was driven about 125 feet north and a drift established parallel to the 202 drift for diamond drilling of the No. 2 Vein at greater depth. In 1966 a low level adit will be driven from about 2,000 feet west-southwest of the present mine workings and 30 feet above the level of Great Bear Lake to pass beneath the present workings and give backs of about 170 feet in the veins.

The No. 2 vein varies some in character from place to place in the mine. At the northeast end of 202-8-1 stope in particular, the vein contains considerable chalcopyrite mineralization. Along part of the 202-6-3 stope area the vein contains a central core of coarsely crystalline galena and carbonate bordered on either side by a narrow band of chalcopyrite. At the southwest face of this stope the vein is 4 to 5 feet in width and contains abundant coarsely crystalline pink calcite. A flesh coloured carbonate mineral, possibly manganese-bearing, is also present and chalcopyrite occurs as patches in the carbonate and as good crystals lining vug surfaces. Some prominent ice-filled vugs up to  $1\frac{1}{2}$  feet across occur along the center of the vein. A galena-rich vein, which also contains sphalerite and minor pyrite, occurs along the vein at the level of the upper adit. The No. 3 vein along the 6-3 stope area contains some niccolite.

Although the veins are generally silver-bearing, high grade sections occur only irregularly. A vein which is essentially barren of silver may suddenly be found to contain abundant rounded blebs and masses of argentite. This may occur without any apparent change in the character of the vein, or the vein may suddenly widen with the additional width consisting of high-grade ore. Likewise high-grade sections may terminate abruptly along strike.

Deep drilling at the mine has resulted in some good silver intersections and thus completion of the low-level adit and planned renovations to some of the buildings on the property should result in a stable and prosperous period of production.



EL BONANZA

The El Bonanza property is located on Great Bear Lake 4 miles southwest of Port Radium. The early work on the property was done in 1935 and 1936. A shaft, inclined at  $68^{\circ}$  in the direction S  $30^{\circ}$  W, was sunk to a depth of 160 feet with levels established at 80 ft. and 160 ft. An old adit, from which an internal shaft was sunk to an unknown depth, was driven eastward from a point approximately 600 feet northwest of the main workings. A vein of high-grade silver ore three inches in width was reportedly encountered at a depth of 30 feet in the internal shaft. The main workings were de-watered and underground work was done in the period September 1956 to February 1957. During this period a long drift was driven from the second (160-foot) level. The results of this work are unknown.

During 1965 the property was re-activated. Work commenced on March 2nd and de-icing of the workings got underway on April 20th; ice extended to a depth of 80 feet. Mining began on the first level on June 19th and de-watering made the second level accessible by about the end of August.

On the first level a drift extended 65 feet southeast from the shaft with high-grade silver ore for the first 25 feet. This area had previously been stoped out to a height of 16 feet with some underhand stoping in the floor. The main work during 1965 consisted of drifting northwestward from the shaft for an estimated distance of 250 feet. For approximately 50 feet from the shaft the drift was in ore grade material. After passing through a long barren section a silver-bearing vein was again encountered. It is estimated that 300 tons of ore may have been added to the previous stockpile, for a total of perhaps 1000 tons. No ore was shipped from the property during the year.

LITEN MINING COMPANY

The company continued mining operations during the summer season, as outlined for the previous year by Schiller (1965), on the Garskie property at Little Sproule Lake, 33 miles northeast of Yellowknife (mineral claim sheet 85-I-12). Liten Mining Company is a private company incorporated in Alberta.

During the 1965 season ore was mined from the Million Dollar, Galena and Old Parr pits. The pits were enlarged as follows:

1. In the Million Dollar pit the work consisted of slashing the north and south walls for a total volume of 124 cubic yards of rock.
2. A total of 46 cubic yards of rock had been removed from the Galena pit previous to 1965. During 1965 a pit or "shaft" about 6 feet by 20 feet was sunk approximately 17 feet from the bottom of a large irregular pit about 5 feet deep. Half of the "shaft" area was sunk an additional 3 feet.
3. The Old Parr pit, from which 30 cubic yards of rock had previously been removed, yielded 90 cubic yards during the year. A "shaft" about 20 feet by  $3\frac{1}{2}$  feet was sunk to a total depth of 28 feet. A "drift" 7 feet in length and  $2\frac{1}{2}$  feet in width was driven from the bottom of the pit.

The same equipment as described by Schiller (1965) was in use on the property. Information as to the number of ounces of gold produced during the season is not available.

TUNDRA GOLD MINES LIMITED

Tundra Gold Mines is located a few miles south of Matthews Lake and approximately 150 miles northeast of Yellowknife. The mine was brought into production on April 1, 1964. The production statistics for the first full year of operation are as follows:

Ounces recovered: Gold	-	25,115
Silver	-	5,623
Tons milled	-	44,778
Average milling rate	-	123 tons per day
Average mill heads	-	0.58 oz.
Recovery	-	96.73%

The ore reserves as of March 31, 1965, were 100,000 tons with an average grade of 0.76 ounces gold per ton and 200,000 tons of probable ore with an average grade of 0.50 ounces gold per ton. During March 1965 the desired production level of 140 tons per day or about 3,000 ounces of gold per month was attained. For the calendar year 1965 the production figures were as follows:

Bullion produced	-	31,259 oz.
Tons milled	-	51,261
Average milling rate	-	140
Grade recovered	-	0.610

The main vein on the property is the Matthews vein and mining was essentially restricted to this vein. Development work was carried out during the year on the No. 2 Vein. This vein is located about 3,000 feet southeast of the head-frame. A drive was started to the vein in September from a point 3,000 feet south of the shaft on the 1,225 foot level. Only little progress was made in October due to a breakdown of the main diesel electric power plant; only sufficient power for mining and milling was produced by the standby diesel units. By the end of the year drifting had been carried out for 140 feet along the vein. One section 21 feet in length averaged 0.68 oz. and the last 35 feet averaged 0.42 oz. over mining widths of 4 feet. Two drill holes returned values of 0.91 oz. over 4 feet and 0.55 oz. over 1.3 feet at distances of 25 feet and 70 feet, respectively, south of the drift face.

DISCOVERY MINES LIMITED

Discovery Mines is located 52 miles north-northeast of Yellowknife.

Production figures for 1965 are as follows:

Bullion produced	-	55,864	
Tons milled	-	80,546	
Average grade milled	-	0.71	
Average grade recovered in dollars	-	26.27	
Milling rate averaged	220.6 tons per day		

A description of the geology and mine workings has been given in previous editions of the annual series. The gold deposits occur within folded meta-greywacke and slate north of, and enclosed in the east side of a northerly striking, westerly dipping, lens of basic volcanic rock.

During 1965 production was mostly from the No. 16 and No. 4B veins. Lesser amounts of ore were produced from the No. 5, No. 1 and No. 6 veins. Below about 19 Level (2700-foot depth) the No. 16 and No. 4B veins appear to converge into a single structure. Limited development of the 4B vein on the 26 Level (3800-foot depth) was completed and further development is planned here and on 27 Level (3950-foot depth), which will be the lowest level with the present shaft depth of 4060 feet.

The milling rate was increased to about 230 tons per day by the addition of a third ball mill in late August. At year end the broken ore reserves were 68,660 tons with an average grade of 0.76 oz. gold per ton. The proven ore reserves stood at 190,540 tons with an average grade of 0.82 ounces per ton. In excess of 100,000 tons of the ore reserves are contributed by the 4B vein.

No surface exploratory drilling was carried out during the year. A total of 21,383 feet of underground diamond drilling was performed. The drilling indicated a favourable greywacke horizon about 300 feet northwest of the No. 1 vein. On three levels, 3350 feet to 3650 feet, single high grade intersections over narrow widths were obtained.

CON, RYCON AND VOL MINES

The Con-Rycon Mine is located at Yellowknife and is the oldest operating gold mine in the Northwest Territories. Production for 1965, divided between the Con, Rycon and Vol properties approximately 59.6%, 36.0% and 4.4% respectively, was as follows:

Bullion produced	110,579.15 ounces
Tons milled	169,198
Average grade recovered	0.654 oz./ton

Details of the geology of the mine and vicinity have been given by Baragar and Hornbrook (1963) and Boyle (1961). Production in 1965 was from the Campbell shear system. Very little information has, as yet, been obtained concerning the Campbell shear zone on the 4,300-foot level. During 1966 the B-3 winze will be deepened from 4,300 feet to 4,900 feet below surface to give levels at 4,500, 4,700 and 4,900 feet.

Mining was carried out in the following zones during 1965:

101 Zone This zone is located in the hanging-wall of the Campbell shear system south of the winze. Ore was produced from between the 3,900 and 3,100-foot levels. Some short and narrow shoots are being tested as to grade on the 3,700-foot level and a stope is being developed on the 3,900-foot level.

102 Zone Production is still being derived from between the 3,300 and 2,900-foot levels.

103 Zone Mining in this zone continued as reported last year by Schiller (1965).

Development work was performed on the following levels:

4,300-foot level - the main crosscut was advanced 1,600 feet west to completion about 200 feet west of the Campbell shear zone. About 1,500 feet of drifting in the hanging-wall was completed to the south. Test drilling into the shear zone will be started early in 1966.

4,100 foot-level - the main crosscut was advanced about 200 feet west to completion in the Campbell shear zone and about 1,500 feet of drifting was done to the south. Two ore shoots were outlined and other lenses were encountered which were below ore grade.

3,900-foot level - the drift on this level was advanced about 800 feet south in the 101 zone and one lens of ore was encountered.

3,700-foot level- about 700 feet of development was done to the north to explore the 5-103F zone. This completes the development to the north, which extends 1800 feet north of the main crosscut. The drift to the south of the crosscut was extended 800 feet for a total of 2100 feet. Several narrow lenses below ore grade were located.

3,500-foot level - a drift was extended about 250 feet north in the 101 zone from existing workings. A new ore shoot was outlined which may correlate with a shoot known on the 3,700-foot level.

On other levels development work consisted only of stope preparation in the 101 and 102 zones.

GIANT YELLOWKNIFE MINES LIMITED

The Giant Mine is the largest gold producer in Canada and is located 3 miles north of Yellowknife. Production figures for 1965 are as follows:

Bullion produced	-	255,024	ounces
Tons milled	-	395,001	
Calculated grade recovered	-	0.722	oz./ton
Percentage recovery	-	89.51	

Milling rate averaged 1082 tons per day. Ore reserves on the Giant property as of Dec., 1965, were 2,370,000 tons averaging 0.70 ounces Au per ton and an additional 236,000 tons on the LOLOR claims averaging 0.72 ounces. The corresponding figures for 1964 were 2,310,000 tons at 0.74 pz. Au per ton and 162,000 tons at 0.73 oz. on the LOLOR claims. Operating costs during 1964 were \$11.95 per ton as compared to \$12.26 per ton in 1963. During 1965 the cost per ton was \$12.88.

Principal exploration and development work during 1965 was again concentrated toward the north end of the mine. On the B-3 2nd. (315 foot) and 4th (575 foot) levels, drifts were extended 528 and 868.5 feet, respectively, for further drilling of the L.A.W. Zone. These drifts are both in the footwall of the middle part of the L.A.W. structure and now extend to sections 5200 ft. North and 5500 ft. North, respectively. Exploratory drilling from the 750 foot level in this area, continued from 1964, was carried out to trace the extension of the A.S.D. Zone at depth.

On the 750 foot level 1,651 feet of drifts and crosscuts were driven for development of the Supercrest (Akaitcho) property. A total of 1244.5 feet of raising and 178 feet sub-level work at 1400 foot elevation has also been completed. A ventilation-escapeway is presently being put in to connect with the Akaitcho shaft.

The G. B. Zone, the west-dipping easterly portion of the "U-shaped" trough formed by the schist zone, is being followed up dip from the 750 level. Drilling is proceeding from drifts in the footwall on the 750 foot level and the hanging wall on the 575 foot level. These drifts have been advanced 495 ft. and 416 ft.

respectively, during the year. The G.B. Zone is in part on LOLOR claims in which Conwest Exploration Limited have an interest.

On the LOLOR property the 411 North drift (575 level) was driven 416 feet for exploration of the upper part of the LOLOR ore zone. Also the 777 South drift (750 level) was driven 495 feet for exploration of both the Giant and LOLOR ore zones above 750 level. During 1965, 106 tons of ore were produced from the LOLOR property which yielded 111 ounces of gold.

The surface diamond drilling program for the year consisted of 79 holes. Much of the drilling was done on the U.B.C. Zone tracing it into the West Bay Fault. Some drilling was in the upper B and C shaft areas where the ore zone comes close to the surface. The possibility that orebodies might occur near surface in this area, where it was suspected that the schist zone rolled over to become roughly horizontal, was tested. The surface drilling also traced the North Giant and L.A.W. structures westwards.

Mapping on a scale of 100 feet to the inch from the Giant Yellowknife Mines property northward was carried out under the supervision of Ken Polk for Giant, Supercrest and Falconbridge interests. A narrow belt extending north from the old Brock shaft and a second belt east of the West Bay Fault and extending from the B shaft area to just north of the Akaitcho shaft and northeast to the Akaitcho Fault were mapped.

On the Northbelt Yellowknife (formerly Crestaurum) property a cross-section of 6 holes totalling 6,257 feet was drilled along a S 60° E line. This property is held by Falconbridge Nickel Mines Ltd. (50%) and Transcontinental Resources (50%). Detailed mapping at 100 feet to the inch of the extension of the drilled zone covered a belt 400 feet wide from Daigle Lake to the center of claim VARGA 17. About 1000 feet south of this another belt running N 60° W was mapped which extended for 3200 feet from the northwest corner of claim VARGA 19.



PINE POINT MINES LIMITED

The property of Pine Point Mines is located south of Great Slave Lake and is approximately 60 miles east of Hay River. The company is controlled by Cominco Limited. The company is engaged in open pit mining of the lead-zinc deposits which occur in flat-lying "reef" dolomites of the Middle Devonian Presqu'ile Formation. Summaries of previous developments on the property have been given by Schiller and Hornbrook (1964) and Schiller (1965).

During 1964 the mine shipped 17,131 tons of high-grade crude ore to Trail and Kimberley. Crude ore shipments continued throughout 1965 and the effective date of starting production, for the beginning of the 3-year tax-free period, was established as March 1, 1965. The crude ore was shipped to Kimberley and Trail, B.C., and to the Bunker Hill Co. at Kellogg, Idaho. The mill began operation, on schedule, in November, 1965. All the concentrates produced to the end of the year were shipped to the smelter at Trail, B.C.

Production for the year consisted of 364,168 tons of crude ore with an average grade of 22.5% Pb and 29.1% Zn and 75,356 tons of milling ore with an average grade of 4.27% Pb and 7.63% Zn. Treatment of the milling ore resulted in 3,524 tons of lead concentrates containing 5,123,896 lbs. Pb and 8,377 tons of zinc concentrate containing 9,801,090 lbs. Zn.

During 1966 the shipment of high-grade crude ore will be continued. In addition to Trail, B.C., concentrates will also be shipped to Japan and other markets. The agreement with Mitsubishi Cominco Ltd., which company was formed for the construction of a smelter in Japan, guarantees a market for up to 31,500 tons of lead metal in concentrates per year for 10 years.

The mine has a total of 26 known orebodies. Twelve of these deposits were located by the drilling of 23 induced polarization anomalies. Induced polarization geophysical surveys have covered approximately 25% of the 1,891 claim property and have resulted in a total of 41 anomalies. It must be considered, however, that the induced polarization method will be much less

successful on the westernmost part of the Pine Point Mines property because of the increasing depth to the very favourable Presqu'ile Formation.

Mining has been restricted to the O-42 and N-42 deposits. The O-42 orebody has a high-grade core about 600 feet in diameter and a total length of 1,100 feet. The N-42 orebody has overall dimensions of about 1,600 feet by 600 feet. The O-42 orebody is in excess of 100 feet thick in places and N-42 reaches a maximum thickness of 90 feet. The deposits are elongated in a north-east direction and may display a zonal arrangement of minerals. In O-42 orebody, for example, there is a core of high grade ore with sphalerite predominant over galena, and this is surrounded by a relatively narrow rim in which the galena content is markedly higher. Beyond and outside the high grade ore there is a sharp transition into much lower grade material. Disseminated marcasite may occur with the ore or about the periphery of the orebodies, and large bodies of sub-ore marcasite are present. As noted by Schiller (1965, p.49) some of the deposits are vertically zoned with lead more abundant in the upper portions. Around the O-42 deposit, at least, the dolomite beds show some arching as the deposit is approached and this is followed by an increase in fracturing and disorientation of large blocks of the country rock until, adjacent to the ore, the rock is highly brecciated.

During 1965 a total of 5,369,656 tons of waste rock and overburden were stripped, largely in preparing a third deposit, N-32, for production. It is hoped that when production is achieved from this deposit the control of mill grade will be easier.

Ore reserves as of the end of the year were estimated at approximately 21.5 million tons averaging 4% Pb and 7.2% Zn. This represents an increase of 4 million tons over the reserve figures quoted at the end of 1964.

KEEWATIN DISTRICT

SELCO EXPLORATION COMPANY LIMITED

Selco Exploration Company Limited holds Prospecting Permits 44,45,46 and 47 covering, respectively, parts of 65-G-1, 65-G-2, 65-H-4 and 65-B-16. Permit 46 includes Otter Lake and, south of this, the old LOWD group of claims which were staked in 1949 by Kasba Explorations Ltd. Permit 47 covers an area approximately 12 miles long by 8 miles wide extending west from Hurwitz Lake. Permit 45 includes Mountain and Hawk Hill Lakes and the AXE group of 108 claims covering the south part of Mountain Lake. Permit 44 covers the area east of this and includes, in the northwest corner, the BEE 1-7, JEAN 1-18 and DOT 1-18 claims which extend south from the company's main camp site on the Kognak River. The company holds the ANT 1-44, PAT 1-53 and JOE 1-18 claims (65-G-7,8) extending north from the main camp to the southwest corner of Cullaton Lake. The RITA group of 30 claims (65-G-7) lies 2 miles west of the PAT group and 5 miles west of the south end of Cullaton Lake. The HOOK group of 20 claims lies an additional 6 miles west and 2 miles north of Griffin Lake. The GREG group of 16 claims (65-G-8) lies  $2\frac{1}{2}$  miles north of Bernier Lake.

Five 2-man prospecting parties were supported in the area during the 1965 season and carried out reconnaissance prospecting, geological mapping and assessment of showings. Assay facilities and a Cessna 185 aircraft were maintained at the company's main camp on the Kognak River. The assessment of gold showings was by trenching, sampling, geological mapping and the use of geophysical methods. No contract diamond drilling was carried out and no further claims were staked during the 1965 season. It is anticipated that the program for the 1966 season will be of the same type and scale.

Kilgour Gold Mines Limited

Mr. J. Kilgour has worked for a number of seasons in the area immediately north and east of the north end of Snowbird Lake. The COP group, of which claims 3-10 are still in good standing, were staked in July, 1963. The adjoining BAB 1-13 group was staked in August, 1964. These claims are shown on mineral claim sheet 65-D/NE (approximately 60° 55' N latitude, 102° 24' W longitude). The BULL 1-18 group (mineral claim sheet 65-E-1) was held by J. Kilgour but lapsed August 28, 1965. A visit was made to the area on August 17th, 1965. At this time staking and trenching work was being carried out at approximately 60° 00' N latitude and 102° 30' W longitude. The BOOT 1-12 and PUG 2-12 groups were recorded from this area.

Work in the area by Mr. J. Kilgour and associates was partially financed by a grubstake syndicate during the 1964 season. In 1965 the work continued with the backing of Northgate Exploration Limited. During the latter part of the year Kilgour Gold Mines Limited was formed to continue evaluation of showings in the area and 119 claims were transferred to the company.

The COP and BAB groups have been briefly described by Schiller (1965, p.14). The main gold showing on the BOOT group consists of a fracture zone 5 feet in width cutting greenstone. The zone is heavily mineralized with sphalerite, galena, chalcopyrite, arsenopyrite, marcasite and pyrite in varying amounts. Quartz is the principal gangue mineral but a minor amount of pale to deep violet fluorite is also present. Some good gold assays have been obtained.

The main showing on the PUG group has been trenched over a length of about 50 feet. This showing consists of quartz with some pyrite mineralization over a width of 1½ to 3 feet in a shear zone in red coloured quartz-feldspar porphyry. The shear zone disappears under a boulder field to the south and under overburden and thence a small lake to the north. Assays from the showing have not been too encouraging but some good gold assays have been obtained from boulders located about 1000 feet to the west. It is thought that these boulders may come from the strike extension of the main zone to the north. The boulders

suggest a quartz vein 3 to 4 feet wide and are well mineralized with seams of massive pyrite which is very pale in colour; the vein material is thus strikingly similar to that of the gold veins at Coronation Gulf.

Hudson Bay Mining and Smelting Co. Ltd.

The company maintained a base camp at the north end of Kasba Lake in Mackenzie District for at least part of the 1965 season. A Cessna 180 airplane on seasonal charter was used for geological reconnaissance and the checking of features shown on aeromagnetic maps of the area. Three prospecting crews of 2 men each were working in the general area on August 17th when the camp was visited.

One exploration party was located south of Snowbird Lake and just north of the Saskatchewan border. Another party was examining a gossan along the north contact of a gabbro stock just west of Ennadai Lake (Keewatin District). A visit was made to the third party working just northeast of Watterson Lake, also in Keewatin District. The main showing being investigated at the latter locality is at approximately  $61^{\circ} 21' N$  latitude and  $99^{\circ} 06' W$  longitude.

The showing consists of a rust zone exposed along a length of 2,300 feet and a width of as much as 100 feet in well-layered amphibole-rich rocks. These rocks have probably formed from andesitic tuffs. The rocks strike east-west and dip approximately  $50^{\circ}$  south. The rust zone is conformable and has formed in part as a consequence of the presence of disseminated pyrite and pyrrhotite in the amphibole-bearing metamorphic rock, but also because of zones of massive pyrite, pyrite and pyrrhotite, or quartz with coarse pyrite. These zones are exposed over widths of several feet and some gold colours have been panned. In one place some specks of visible gold are reported to have been seen. However, chip and grab samples showed no values in precious or base metals. The northern boundary of the zone of rust staining is not well exposed. At the east end the zone appears to narrow to about 60 feet and andesite is exposed on the north boundary. Some magnetite is present here in association

with pyrrhotite. Serpentinized ultrabasic is exposed at an estimated distance of 800 to 900 feet to the north of the mineralized zone.

KENNCO EXPLORATIONS (CANADA) LIMITED

Kennco Explorations (Canada) Limited holds Prospecting Permit No. 48 which covers area 55-K-10 on the shore of Hudson Bay just southwest of Rankin Inlet. The geology of this area is shown by Lord (1953). The rocks consist of volcanics, largely andesitic and dacitic greenstones, which have been intruded by acidic plutonic rocks. The latter range from granite to granodiorite and, together with associated gneissic rocks, occupy the greater part of the area.

During the 1965 season parts of the WP 1-12 and BETH 1-6 claim groups were covered by a ground electromagnetic survey which totalled 19.8 line miles on a grid with line spacing of 400 feet. These claims were staked previous to the granting of the prospecting permit and high-grade copper samples have been obtained from the area covered by the claims.

Most of the remaining part of the Permit area was covered by an airborne magnetic-electromagnetic survey flown at approximately  $\frac{1}{4}$  mile intervals. This survey covered a total of 921 line miles. Two 2-man prospecting teams worked in the area during the season and additional work is planned for 1966.

FRANKLIN DISTRICT

Bankeno Mines Limited

The Consolidated Mining and Smelting Company of Canada continued working during the 1965 season on the Little Cornwallis Island property according to the terms of the option agreement with Bankeno Mines. Lead-zinc mineralization was discovered on Little Cornwallis Island by Bankeno Mines in 1960. The East or Eclipse showing was discovered and preliminary sampling carried out in 1961. The showing was further sampled in 1963. The general geology of the area and the nature of the deposits have been outlined by Schiller (1965).

Mineralization occurs in brecciated zones in a dolomite-limestone horizon of Ordovician age. The fact that mineralization is restricted to a particular horizon over a broad area of both Little Cornwallis and Cornwallis Islands appears to have been established. Galena, sphalerite and smithsonite are the principal minerals.

Work in 1965 was concentrated on the Eclipse showing (mineral claim sheet 68-H-9). This showing is covered by the Eclipse group 1-22, staked in 1961, the Tundra group 1-19 and the unnamed claims N 32665 to N 32713, for a total of 90 claims. From earlier surface work the showing appears to have a strike length of about 2,000 feet and widths of 300 to 400 feet. A sample across a width of 370 feet averaged 2.15% lead and 26.2% zinc. Thirty-seven holes totalling 2,311 feet were drilled on this showing during the 1965 season. In addition, an induced polarization survey covering 15.15 line miles was carried out. Nine of the 37 holes served to partially outline 3 separate zones of lead-zinc mineralization. One zone was indicated in 6 drill holes and is estimated to contain 900,000 tons averaging 13% zinc and 2% lead. Four of these holes were bottomed in lead-zinc mineralization. The 49 unnamed claims mentioned above were staked in 1965.

The Consolidated Mining and Smelting Company also did limited prospecting in a 400 to 500 square mile area on Cornwallis Island. Part of the work consisted of stream geochemistry. Four lead-zinc zones were located in the area and one

of these zones contains lead and zinc minerals in rubble and surface soil over a strike length of 8,000 feet. The Walrus claims 1-40 (mineral claim sheet 58-G-11) were recorded.

Application has been made by Cominco-Bankeno for prospecting permits covering 900,000 acres on Cornwallis Island. Work planned for the 1966 season includes further drilling on the Eclipse showing, examination of the original lead-zinc discoveries on the west side of Little Cornwallis Island, and prospecting of the permit areas on Cornwallis Island.



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