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REPORT ON  
LIZAR TOWNSHIP GOLD PROSPECT  
OF  
PRIMROCK MINING AND EXPLORATION, LIMITED

BY

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DECEMBER 1, 1969.

## SUMMARY

Primrock Mining and Exploration, Limited, holds claims covering a gold prospect located in Lizar Township, District of Algoma, Ontario, about 40 miles northeast of White River. The location is illustrated in Figure 1. Access is by air from White River, or via a 19 mile-long winter road from Price on the Algoma Central Railway.

The company's property consists of 52 unpatented, unleased, unsurveyed mining claims numbered as follows: SSM 82981 to 82989 inclusive, SSM 83323 to 83325 inclusive, SSM 100674 to 100687 inclusive, SSM 206610 to 206629 inclusive, and SSM 228501 to 228506 inclusive. Figure 2 presents a claim map of the property.

Hiawatha Gold Mines, Limited, carried out surface and underground exploration and development work on the prospect from 1937 to 1939. A shaft was sunk to a depth of 299 feet, and levels were established at depths of 150 and 275 feet. On the first level, 847 feet of drifting and 967 feet of cross-cutting were completed; while on the second level, 2,547 feet of drifting, 1,750 feet of cross-cutting, and 250 feet of raising were completed. Totals of 3,474 feet of underground diamond-drilling, and 13,034 feet of surface diamond-drilling, were completed.

A small amount of gold was produced as a result of bulk sampling. In 1937, 17.8 ounces of gold, having a value of \$624, were produced from the milling of 3 tons of material (Ontario Department of Mines, Annual Report, 1938, vol. 47, part 1, table facing p. 10). In 1939, a 25-ton per day test mill treated 1,928 tons from which gold having a value of \$4,970 was produced (Ontario Department of Mines, Annual Report, 1940, vol. 49, part 1, p. 18). That these figures may not accurately reflect the grade is suggested by reports that visible gold occurred frequently in the veins (D. E. Smith, 1967, p. 17; W. F. James, 1938), and that theft of gold from the property was common (D. E. Smith, 1967, p. 19; verbal reports from R. McCarthy, President, Primrock Mining and Exploration, Limited).

Operations ceased briefly at the property in September, 1939, because of the outbreak of war. They were resumed later in the month and continued into December, 1939, when they ceased permanently, presumably for reasons connected with wartime conditions. According to correspondence cited in the report of D. E. Smith (1967, p. 19) the company intended to resume activity at some time in the future. However, by the early 1960's most of the company's officers had become deceased, and the company's title to its property lapsed.

The property came open for staking in 1966, when part of it was staked by Mr. Roy McCarthy, and subsequently transferred to Primrock Mining and Exploration, Limited.

In the summer and fall of 1969 Primrock carried out a program of exploration on the property. The old mine workings were dewatered, surveyed, and sampled, and two diamond-drill holes, with a total length of 250 feet, were drilled from surface to test a second gold occurrence located 1/2 mile southwest of the old mine. Total cost of this work was \$93,985.33.

Following completion of this work, Mr. W. Roy McCarthy, President of Primrock Mining and Exploration, Limited, requested the writer to review the available information concerning the property, and if further work were justified, to outline a program of exploration. The writer visited the property on October 18, 1969, and has reviewed all available technical data concerning the property.

The property is underlain by Precambrian metamorphosed mafic volcanic rocks (greenstones) and intrusive sills of quartz porphyry and granodiorite, all of which are intruded by lamprophyre and diabase dikes. The greenstones, the quartz porphyry and granodiorite sills, strike N 50° E and generally dip vertically. The diabase dikes strike N 20° W and dip vertically.

A fault zone, termed the Bear Creek fault zone, and striking N 60° E, appears to underlie the lake at a point about 400 feet northwest of the shaft.

The rock unit of major interest is a granodiorite sill about 400 feet wide, with a strike length of about 2-1/2 miles, all of which appears to lie within the Primrock property boundaries.

Gold occurs in 3 known zones upon the property, 2 of which were explored in the old mine workings.

The zone which at present appears to be of most interest lies about 340 feet southeast of the shaft, and consists of five, possibly six, parallel quartz veins and silicified shear zones which occur in the granodiorite sill within a zone about 120 feet wide on the south side of the sill. The veins and shear zones strike N 50° E and generally dip vertically, and are hereafter collectively termed the South Zone.

In the immediate vicinity of the shaft, a quartz vein, termed the North Zone, follows a contact between greenstone and a quartz porphyry sill. Both the North

and South Zones were investigated underground.

About 1/2 mile southwest of the mine workings a third gold-bearing zone, termed the West Zone occurs. It is geologically similar to the North Zone.

Unfortunately no engineering records of Hiawatha Gold Mines, Limited, are available to-day, with the single exception of 2 partially complete level plans. Knowledge of the gold content of the important South Zone depends largely on the results of sampling carried out in 1969 by Mr. L. J. McCarthy, Vice-President, Primrock Mining and Exploration, Limited.

Within the South Zone, the most important vein appears to be that which has been followed on the 275-foot level in 2-6E drift for 1,026 feet, where it is exposed continuously over widths of from 1 to 3 feet, except where intruded by diabase dikes. The total width of the dikes is not accurately known, but is approximately 290 feet. The vein evidently extends at least an additional 365 feet in 2-6W drift. Samples 2-1 to 2-35 inclusive; 2-39; 2-43; 2-44; 2-46 to 2-79 inclusive; and 2-86 to 2-91 inclusive, were collected from this zone over a total length of 1,391 feet. Sample widths ranged from 1.0 to 5.0 feet. The assay results and widths are tabulated in Appendix I; the range and frequency of the assays in Table II.

The nature of the sampling does not permit calculation of tonnage and grade. Inspection of the results indicates that while the gold content is erratic, numerous economically significant assays occur: of the 78 samples assayed from this zone, 40 contained 0.30 or more oz. Au per ton.

Sixty-five feet north, a parallel zone has been exposed in 2-20W drift. Three samples taken by Mr. L. J. McCarthy over a length of 172 feet assayed 0.02 oz. Au per ton over 2.0 feet; 2.81 oz. Au per ton over 2.0 feet; and 1.31 oz. Au per ton over 1.4 feet.

The North Zone, prior to underground exploration, was estimated to have an average grade of 0.35 oz. Au per ton across an average width of 3.5 feet for a length of 1,500 feet (G. L. Holbrooke, 1937, p. 2). The fact that most of the underground work was concentrated on the South Zone suggests that the operators of Hiawatha Gold Mines, Limited, considered the North Zone to be of minor importance.

The West Zone lies about 1/2 mile southwest of the shaft, and has been explored by drilling and trenching.

It is described (G. L. Holbrooke, 1937, p. 2 and map) as being 220 feet long, 3.5 feet wide, and with respect to grade, it was noted that "four drill holes, 50 feet apart, under this (.....zone) all ran better than 1.3 oz. and the surface showing shows abundant free gold". Two holes drilled in 1969 by Primrock, spaced 105 feet apart along strike, cut the zone at vertical depths of 58 and 80 feet, and averaged 0.27 oz. Au per ton over a calculated true width of 2.1 feet, and 0.40 oz. Au per ton over a calculated true width of 2.2 feet.

Another mineralized vein, 4 feet wide and with a minimum length of 150 feet, occurs about 1/2 mile southwest of the West Zone. No assays of this zone are available.

A drill hole directed northwards from the second level near the shaft is reported to have cut the Bear Creek fault zone, then to have intersected 8 feet of quartz vein material in granodiorite approximately 520 feet northwest of the shaft. No assays of this vein are available.

CONCLUSIONS

1. Previous work has revealed the presence of economically significant amounts of gold in the South and West Zones. The veins exposed in 2-6E and W, and 2-20W drifts, and the vein of the West Zone merit detailed exploration with the object of determining their average gold contents and tonnages.

2. Results of past work on the North Zone suggest that no further exploration of this zone is warranted at this time.

3. The known strike length of the 2-6 vein in the South Zone, at least 1,390 feet, together with its apparent vertical persistence to a minimum known depth of 275 feet, suggest that this vein, and the nearby parallel veins, occupy an extensive zone of shearing in the host granodiorite sill.

The granodiorite sill, extending over a strike length of 2-1/2 miles, warrants detailed prospecting throughout its length in a search for extensions of the known veins and for as yet unknown zones.

RECOMMENDATIONS

A program of detailed exploration should be carried out to determine the average grade and potential tonnage of both the South and West Zones. Other work, of a less detailed nature, should be done to prospect for strike extensions of these zones and for as yet unknown zones. In more detail, the following points are recommended:

1. The underground workings should be pumped out, washed and scaled, and channel samples should be taken at regular 10-foot intervals across the veins exposed in 1-6E and W; 2-6E and W; 2-20W; and 2-4E drifts. Channel samples, each 10-feet long, should be taken from the short cross-cuts off these drifts, and from the southern 120 feet of the main cross-cut on both levels. Approximately 4,000 feet of underground drilling should be done to explore these veins between the first and second levels, and below the second level.

In addition, approximately 5,200 feet of surface drilling should be done in the vicinity of the mine to explore the veins in areas beyond practical reach of underground drilling.

Beyond the mine workings, the strike extensions of South Zone veins should be searched for by relatively widely-spaced drill holes. Approximately 1,200 feet of surface drilling should be allotted to this phase of the program.

2. The underground workings should be geologically mapped in order that sample results may be properly interpreted.

3. A picket-line grid should be cut on surface, so as to cover the property from the vicinity of the mine southwest to beyond the West Zone. The baseline of the grid should be accurately surveyed in order to relate it accurately to the underground workings.

A geological survey, supplemented by a magnetometer survey, should be carried out in order to locate accurately the known veins and provide a proper basis for their further exploration.

This work should be done before any surface drilling is started.

4. The West Zone should be explored by trenching and approximately 1,600 feet of drilling.

5. The granodiorite sill should be prospected by conventional surface prospecting methods, and if further mineralized zones are found, they should be explored by drilling. Provision should be made for about 1,000 feet of drilling for this purpose.

6. Gold content of the wallrocks of the veins should be determined in some of those holes that will cut several of the parallel veins in the South Zone. If the wallrocks carry any gold it may be possible to develop a larger tonnage, lower grade deposit than if the individual vein zones alone are considered.

7. According to Mr. Roy McCarthy, servicing of the property by air in 1969 was unsatisfactory. Unforeseen delays caused by bad weather and other commitments of the air service company resulted, from time to time, in lack of essential supplies, leading to costly delays in operations. Based on this experience, Mr. McCarthy requested consideration of a tractor road connecting with Highway 631 as an alternative means of moving equipment and supplies into, and out of, the property.

The estimated costs of building a tractor road and moving equipment and supplies by road range from \$10,000 to \$14,700 more than the cost of moving by air. This would be reduced somewhat by fewer operating delays caused by lack of supplies. In the event of further exploration the road would be an asset, otherwise it is unlikely the investment could be recovered. In the following summary of estimated costs, the costs of the alternative means of transport are set out separately.

The company's directors should determine the total cost of delays in 1969 due to lack of service, and in the light of this information, decide whether or not the construction of a tractor road is warranted.

8. All further exploration work should be carried out under the direction and close supervision of a qualified mining engineer or geologist.



Estimates of the funds required to carry out the proposed exploration work are presented below:

A. Underground Exploration of South Zone

1. Dewatering of underground workings: rental of equipment, fuel	\$ 26,000
2. Washing, scaling; channel sampling; geological mapping; surveying.	8,000
3. Diamond-drilling: 4,000 ft. @ \$6.00/ft.	24,000
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	\$ 58,000

B. Surface Exploration

1. Picket-line grid; 10 miles @ \$90/mile	\$ 900
2. Magnetometer survey: 10 miles @ \$50/mile	500
3. Geological mapping and surveying	3,000
4. Prospecting and trenching	3,500
5. Diamond-drilling:	
South Zone mine area: 5200 ft.	
South Zone extension: 1200 ft.	
West Zone: 1600 ft.	
General exploration: 1000 ft.	
Total 9000 ft. @ \$9.00	
	/ft. 81,000
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	\$ 88,900

C. General Support Program

1. Provision for assaying	\$ 4,000
2. Camp buildings and supplies, food, radio - telephone	10,200
3. Administration	4,500
4. Transportation (see point 7 of recommendations)	
option 1. air transport: \$ 13,300	
or	
option 2. tractor road, minor air servicing: \$ 28,000	
Total with air transport:	<hr/>
	\$ 32,000
or Total with tractor road, minor air transport	<hr/>
	\$ 46,700

Summary:

A. Underground exploration:	\$ 58,000	
B. Surface exploration:	88,900	
C. Support program:	<u>32,000</u> <sup>(1)</sup>	or <u>46,700</u> <sup>(2)</sup>
Total:	\$178,900	\$193,600

(1) with air transportation. See point 7 of Recommendations.

(2) with ground and air transportation. See point 7 of Recommendations.

INTRODUCTION

In October, 1966, Primrock Mining and Exploration, Limited, acquired title to mining claims covering the underground workings of the former Hiawatha Gold Mines, Limited, located in Lizar Township, Ontario.

During the summer and autumn of 1969 the company dewatered and sampled the old underground workings, and drilled 2 short diamond-drill holes to test a second gold occurrence on the property.

Following completion of this work, Mr. W. Roy McCarthy, President of Primrock Mining and Exploration, Limited, asked the writer to review the available information concerning the property, and if further work were justified, to outline a program of exploration.

The writer visited the property on October 18, 1969, and has reviewed all available technical data concerning the property, a list of which appears in Appendix II of this report.

PROPERTY, DESCRIPTION AND LOCATION

The company's property consists of 52 unpatented, unleased, unsurveyed mining claims located on the southwest shore of Kabinakagami Lake, Lizar Township, District of Algoma, Ontario, about 40 miles northeast of the town of White River. Figure 1 illustrates the location of the property.

The claims comprising the property are numbered as follows:

SSM	82981 to 82989 inclusive	=	9 claims.
SSM	83323 to 83325 inclusive	=	3 claims.
SSM	100674 to 100687 inclusive	=	14 claims.
SSM	206610 to 206629 inclusive	=	20 claims.
SSM	228501 to 228506 inclusive	=	<u>6</u> claims.
	Total		52 claims.

The writer verified the staking and recording of the above claims by inspection of appropriate records in the office of the Mining Recorder, Ontario Department of Mines, Sault Ste. Marie, on November 19, 1969.

Claims SSM 82981 to 82989 inclusive, and 83323 to 83325 inclusive, were staked September 5, 1966, and were transferred to Primrock Mining and Exploration, Limited, on October 7, 1966.

Claims SSM 100674 to 100687 inclusive, were staked on April 7 and 8, 1968; claims SSM 228501 to 228506 were staked on September 16 and 17, 1969: these claims are recorded in the name of Roy McCarthy (President, Primrock Mining and Exploration, Limited).

Claims SSM 206610 to 206629 inclusive, were staked on various dates from September 4 to 15 inclusive, 1969, and are recorded in the name of Lorne Joseph McCarthy (Vice-President, Primrock Mining and Exploration, Limited).

Figure 2 is a claim map of the property.

D. E. Smith, P. Eng., in a report dated December 5, 1967, noted (page 12) that "the shaft, sunk when that portion of the property was held by Hiawatha Gold Mines Limited, is located approximately 200 feet southwest of the No. 1 post of claim SSM 82981".

#### LOCATION AND ACCESS

The property is located about 40 miles northeast of White River, and about 60 miles north of Wawa, and is most readily accessible via float or ski-equipped aircraft from these towns.

A winter road 14 miles long leads eastward from the south end of Kabinakagami Lake, at a point 5 miles from the property, to the station of Price on the Algoma Central Railway.

A water route about 36 miles long permits summer access from Oba.

Highway 631, now under construction between White River and Hornepayne, lies 15 miles west of the property. About 20 miles of road would be required to connect the property to the highway.

### LOCAL RESOURCES

The nearest electrical power transmission line lies about 40 miles north of the property.

Kabinakagami Lake is an ample source of water for any future requirements of the company.

The nearest settlement is the village of Oba, with a population of about 100, located 22 miles to the northeast.

### HISTORY AND PREVIOUS WORK

Gold was first discovered on what is now the Primrock property in 1926.

Hiawatha Gold Mines Limited, incorporated in 1936, acquired the property and carried out exploration and development work from early 1937 to the end of 1939. The company carried out surface prospecting, trenching, and completed 13,034 feet of diamond-drilling from surface. A vertical 3-compartment shaft was sunk to a depth of 299 feet, and levels were established at depths of 150 and 275 feet. On the 150-foot level, 847 feet of drifting and 967 feet of cross-cutting were completed; while on the 275-foot level, 2,547 feet of drifting, 1,750 feet of cross-cutting, and 250 feet of raising were completed. A total of 3,474 feet of underground diamond-drilling was carried out.

Some gold was produced as a consequence of bulk sampling. In 1937, 17.8 ounces of gold, having a value of \$624, were produced from the milling of 3 tons of material (Ontario Dept. of Mines, Annual Report, 1938, vol. 47, pt. 1, table facing p. 10). In 1939, a 25-ton per day amalgamation test mill was installed, and operated from June 22 to September 5, and from September 22 to November 30. The mill treated 1,928 tons, from which gold having a value of \$4,970 was produced. (Ontario Dept. of Mines, Annual Report, 1940, vol. 49, pt. 1, p. 18 and 125). The total value of production is thus \$5,594 from 1,931 tons. Later government reports, (e.g., Ontario Dept. of Mines, Annual Report, 1941, vol. 50, pt. 1A, table facing p. 8) record that total production having a value of \$6,826 was derived from 1,931 tons: this minor discrepancy in the total value of production is not explainable at present.

That these figures may not accurately reflect the grade is suggested by reports that theft of gold was common (D. E. Smith, 1967, p. 19; and verbal reports from Mr. Roy McCarthy, President, Primrock Mining and Exploration, Limited).

Operations in 1939 continued from January 1 to September 10, when they were suspended because of the outbreak of war (Ontario Dept. of Mines, 1940, Annual Report, vol. 49, pt. 1, p. 125 - 126). After further consideration, operations were resumed on September 22, and continued until December 4, when they ceased permanently, presumably for reasons connected with wartime conditions.

Evidently the company intended to resume activity at some time in the future, as recorded in correspondence cited in the report of D. E. Smith, P. Eng., (1967, p. 19). However, by the early 1960's, most of the company's officers had become deceased and the company's title to its property lapsed.

The property came open for staking in September, 1966, when part of it was staked by Mr. Roy McCarthy and subsequently transferred to Primrock Mining and Exploration, Limited.

In the summer and fall of 1969 Primrock carried out a program of exploration on the property. The company built a camp, the mine was dewatered, the shaft was rehabilitated to some extent, unsurveyed portions of the workings were surveyed, and the workings were sampled. Two diamond-drill holes were drilled from surface to test a second gold occurrence located 1/2 mile southwest of the mine.

Application of funds, submitted by the company, for the period May 1 to November 15, 1969, was as follows:

Administration	\$ 4,228.78
Commissions	17,227.50
Equipment rentals	26,303.76
Fuel, food, air freight, and general cartage	16,561.57
Labour, accounting, and engineering	28,985.97
Assays	677.75
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Total	\$ 93,985.33

GENERAL GEOLOGY

The property is underlain by Precambrian metamorphosed mafic volcanic rocks (greenstones) and intrusive sills of quartz porphyry and granodiorite, all of which are intruded by lamprophyre and diabase dikes.

The greenstones and the quartz porphyry and granodiorite sills strike N 50° E and generally dip vertically. These rocks are part of a greenstone belt which strikes northeast to east through the Kabinakagami Lake area over a known length of 50 miles, and which contains several gold deposits (Ontario Dept. of Mines maps P. 476 and 1958B). The Primrock property is located at about the mid-point of this belt.

In the vicinity of the old Hiawatha mine workings, the rock unit of major interest is a granodiorite sill lying about 40 feet southeast of the shaft. The sill has a width of about 400 feet, and has been traced along strike for a distance of 2-1/2 miles, all of which appears to be within the Primrock property boundaries. The sill is flanked on the northwest and southeast by greenstones.

About 40 feet north of the granodiorite sill, in the vicinity of the shaft, a sill of quartz porphyry, varying in width from 2 to 10 feet, intrudes the greenstones.

Gold mineralization occurs in 2 main zones in the mine:

1. in quartz veins and silicified shear zones in the granodiorite sill within a zone about 120 feet wide on the south side of the sill. The veins and shear zones strike N 50° E and generally dip vertically. They are hereafter collectively termed the South Zone.

2. in a quartz vein which follows the north contact for the quartz porphyry body, hereafter termed the North Zone.

Elsewhere on the property, gold occurs in a zone geologically similar to the North Zone, and located about 1/2 mile southwest of the mine. This zone is hereafter termed the West Zone.

The greenstones, quartz porphyry, granodiorite, and mineralized zones are cut by small lamprophyre dikes, and by several diabase dikes. The diabase dikes strike about N 20° W, dip vertically, and range in width from a

few feet to 165 feet. The shaft has been sunk on one of these dikes where the dike intersects the North Zone.

The diabase dikes fill fractures along which there has been little or no offsetting of the mineralized zones. Most commonly there is no evident offset of mineralized zones across the dikes: the maximum apparent offset is about 15 feet.

About 400 feet northwest of the shaft there is a well-developed linear valley, occupied by a bay of Kabinakagami Lake and, to the west, by Bear Creek. A drill hole is reported (D. E. Smith, 1967, p. 17) to have encountered a fault zone on the strike of this valley, strongly suggesting that the valley marks the site of a well-developed fault which would strike N 60° E.

The same drill hole is reported (D. E. Smith, 1967, p. 17) to have encountered a quartz vein in granodiorite at a point about 120 feet north of the fault. For convenience, the fault and quartz vein will be referred to hereafter as the Bear Creek fault and Bear Creek vein.

## MINERAL DEPOSITS

### Introduction

As indicated in the preceding section, there are 4 known zones of interest, in 3 of which gold is known to occur.

It is most unfortunate that despite the great amount of work done by Hiawatha Gold Mines Limited, there are no engineering records or reports of this company available to-day, with the single exception of 2 partially complete level plans. Our present knowledge of the dimensions and grades of the mineralized zones is derived largely from a private report on the Hiawatha mine written for Erie Canadian Mines Limited by the company's field engineer, G. L. Holbrooke, in September, 1937; from a brief report by Dr. W. F. James, geologist, in September, 1938; and from press articles from the Northern Miner covering the period February 1937 to November 1939.

During 1969 Primrock Mining and Exploration, Limited, dewatered the mine workings. Mr. L. J. McCarthy, Vice-President of Primrock, completed a survey of the workings and carried out a program of chip sampling on



the South and North Zones. In addition, two drill holes were put down to test the West Zone. Results of this work have added to knowledge of the gold content and dimensions of the zones, but do not permit calculations of tonnages and average grades.

The zones are described below:

#### South Zone

Most of the underground exploration carried out by Hiawatha Gold Mines Limited was concentrated on this zone.

It consists of several parallel quartz veins and silicified shear zones located within the southern 120 feet of the granodiorite sill. The veins and shear zones strike N 50° E, and dip vertically to steeply south. The underground work has disclosed five, possibly six, such vein and shear zones.

Each such zone consists of narrow quartz veins, most commonly ranging in width from a fraction of an inch to 6 inches, but occasionally reaching a width of 3 feet, surrounded by altered wallrock consisting largely of fine-grained replacement quartz, with minor carbonate and mica. Widths of the zones are not accurately known: they appear to range from a few inches to about 3 or 4 feet. As outlined in more detail below, the zones are quite persistent along strike.

Disseminated pyrite, and small veinlets of pyrite which generally parallel the strike of the veins, occur in both the quartz veins and altered wallrock. Minor chalcopyrite and galena are disseminated in both quartz veins and altered wallrock.

Although none was seen by the writer, the references listed above frequently mention the occurrence of visible gold in the veins (D. E. Smith, 1967, p. 17; W. F. James, 1938).

Most of the drifting, on both levels, has been done on the zone exposed in 1-6 east and west drift on the 150-foot level, and in the 2-6 east and west drift on the 275-foot level. While it is not definite that these drifts follow the same zone, the relative positions of the drifts suggest that it is the same zone.

On the first level 1-6E (east) and 1-6W (west) drifts together follow the zone for 400 feet, and in places the backs have been taken down to a height of about 20 feet above track-level. The quartz veins and silicified wallrock are discontinuously exposed throughout the extent of the drifts, and are cut by narrow mafic dikes. Table I below presents the results of chip samples taken at irregular intervals along the drifts by Mr. L. J. McCarthy.

TABLE I

<u>Sample No.</u>	<u>Location</u>	<u>Au, oz./ton</u>	<u>Width, ft.</u>
1- 92	1-6E drift	0.03	2.0
1- 93	1-6E drift	0.62	2.0
1- 94	1-6E drift	2.55	2.0
1- 95	1-6E drift	2.24	2.1
1- 96	1-6E drift	1.25	2.7
1- 97	1-6E drift	0.51	2.8
1- 98	1-6E drift	0.02	2.2
1- 99	1-6E drift	0.76	2.3
1-100	1-6E drift	0.01	2.1
1-101	1-6W drift	0.55	2.3

On the 275-foot level, 2-6E drift extends about 1,026 feet east of the main cross-cut. The mineralized zone is exposed continuously over widths of from 1 to 3 feet, except where intruded by diabase dikes: the total width of the dikes is not accurately known, but is approximately 290 feet.

2-6W drift extends about 690 feet west of the main cross-cut. The writer was unable to examine this drift for more than about 40 feet west of the main cross-cut. The vein persists for this 40-foot length, but thereafter, according to Mr. L. J. McCarthy, it is not exposed continuously, and it is cut by at least one thick diabase dike, and while present in the western part of the drift, the vein becomes quite narrow.

The samples collected by Mr. L. J. McCarthy from these drifts are too numerous to tabulate here, and are given in Appendix I. Samples 2-1 to 2-35 inclusive; 2-39; 2-43; 2-44; 2-46 to 2-78 inclusive; and 2-86 to 2-91 inclusive were collected from this zone over a total length of 1,391 feet. Sample widths ranged from 1.0 to 5.0 feet.

Some idea of the range of the assay returns is presented in the following table, wherein the total number of assays falling within selected ranges are given. All these are from 2-6E and 2-6W drifts; the total number of assays is 78.

Inspection of the assays listed in Appendix I shows that while the gold content is erratic, numerous economically significant assays occur, while from Table II it may be noted that of the 78 samples assayed from this zone, 40 contained 0.30 or more oz. Au per ton.

TABLE II

Range and Frequency of Assays From  
2-6E and 2-6W Drifts

<u>Range</u>	<u>Number of Assays</u>
nil to trace	0
0.005 to 0.09 oz. Au/ton	30
0.10 to 0.29 oz. Au/ton	8
0.30 to 0.49 oz. Au/ton	7
0.50 to 0.79 oz. Au/ton	6
0.80 to 0.99 oz. Au/ton	4
1.00 to 1.99 oz. Au/ton	18
over 2.00 oz. Au/ton	<u>5</u>
Total	78

In the vicinity of Samples 2-13 and 14, 2-53 to 2-59 inclusive; and in the vicinity of Samples 2-60 to 2-72 inclusive; preparations had been made for stopping by the operators of Hiawatha Gold Mines, Limited. In the first case, backs have been taken down to a height of about 25 feet above track-level; in the second, short raises have been driven and slashed out, and chutes installed.

In addition to the zone exposed in 1-6E and W, and 2-6E and W drifts, assay results from the zone exposed in 2-20W drift are of economic interest. This drift lies 65 feet north of 2-6W drift, and extends from a point 330 feet west of the main cross-cut, westward for 220 feet. Three samples were taken by Mr. L. J. McCarthy (Samples 2-83, 84, 85), over a length of 172 feet, and assayed, respectively, 0.02 oz. Au per ton over 2.0 feet; 2.81 oz. Au per ton over 2.0 feet; and 1.31 oz. Au per ton over 1.4 feet. This drift was not accessible at the time of the writer's visit.

North Zone

From the limited information available it would appear that most of the surface drilling carried out by Hiawatha Gold Mines, Limited, was done on this zone.

The zone was described by G. L. Holbrooke (1937, p. 2, private report to Erie Canadian Mines, Limited):

"Following along the north contact of the quartz

porphyry is a narrow quartz vein which occasionally widens into narrow lenses. The vein varies in width from 2 to 14 inches and carries abundant free visible gold".

"The adjoining porphyry carries low gold values and averages about 1.50 dwts. (equivalent to 0.075 oz. Au per ton) over 3.5 feet. The gold in the vein is very erratic and no reliable average can be obtained before bulk sampling is done, but surface sampling plus diamond drilling indicate one shoot at the shaft running about 0.35 oz. across 3.5 feet for a length of 1,500 feet. Fifteen diamond drill holes under this length showed seven with values better than 0.75 oz. across 3.5 feet and eight showed nothing over 0.04 oz."

This zone was investigated by drifting west of the shaft on the first level, and by drifting both east and west of the shaft on the second level.

L. J. McCarthy sampled a small portion of this zone on the first level, and from Samples 1-107, 1-108, and 1-109, obtained assays of 0.17 oz. Au per ton over a width of 3.5 feet, 2.78 oz. Au per ton over a width of 3.0 feet, and 1.87 oz. Au per ton over a width of 2.9 feet, respectively. The three samples were collected over a length of 50 feet. The drift on the first level was in use as a sump at the time of the writer's visit and was inaccessible.

No sampling was done by Mr. McCarthy on the second level, where only the drift west of the shaft is now accessible. During the writer's brief visit no significant vein material was seen in this drift. The drift east of the shaft evidently encountered serious problems of water inflow as it is now sealed with a concrete bulkhead, and difficulties with water inflow were mentioned in a press article (Northern Miner, July 21, 1938).

#### West Zone

This zone lies about 1/2 mile southwest of the shaft. The geological setting is similar to that of the North Zone, and according to a plan accompanying G. L. Holbrooke's report, the West Zone appears to be the strike extension of the North Zone, offset to the south by a fault. Holbrooke describes the intervening vein material as valueless.

The West Zone is described (G. L. Holbrooke, 1937, p. 2) as being about 220 feet long, and it is stated that "four drill holes, 50 feet apart, under this (...zone) all ran better than 1.3 oz. and the surface showing shows abundant free gold". The plan accompanying his report indicates that this zone has a width of 3.5 feet.

In 1969 Primrock drilled 2 holes on this occurrence. The holes, each 125 feet long and spaced 105 feet apart along strike, intersected the vein at vertical depths of 58 and 80 feet. Samples taken by L. J. McCarthy from hole 1A averaged 0.27 oz. Au per ton over a calculated true width of 2.1 feet, while samples from hole 2A averaged 0.40 oz. Au per ton over a calculated true width of 2.2 feet.

Holbrooke (1937, p. 2) reports the existence of another mineralized vein, with a width of 4 feet and a minimum known length of 150 feet, occurring about 1/2 mile further west. No other information concerning this latter vein is available.

#### Bear Creek Vein

A flat hole drilled northwest from the second level near the shaft intersected a fault zone about 400 feet northwest of the shaft, then cut 8 feet of quartz vein material in granodiorite at a distance of about 520 feet northwest of the shaft (D. E. Smith, 1967, p. 17; plan of second level; letter from R. I. Ferguson to I. W. C. Solloway, October 24, 1938, concerning developments at Hiawatha Gold Mines, Limited). No assays of the vein are available.

Respectfully submitted,



P. E. Giblin  
P. E. Giblin, P. Eng.

December 1, 1969.

## APPENDIX I

Summary of Assay Data from Sampling  
by L. J. McCarthy, 1969.

<u>Sample No.</u>	<u>Gold, oz/ton</u> <sup>(1)</sup>	<u>Width, ft.</u> <sup>(2)</sup>	<u>Location</u>
1- 92	0.03	2	1-6E Drift
1- 93	0.62	2	1-6E Drift
1- 94	2.55	2	1-6E Drift
1- 95	2.24	2.1	1-6E Drift
1- 96	1.25	2.7	1-6E Drift
1- 97	0.51	2.8	1-6E Drift
1- 98	0.02	2.2	1-6E Drift
1- 99	0.76	2.3	1-6E Drift
1-100	0.01	2.1	1-6E Drift
1-101	0.55	2.3	1-6E Drift
1-102	0.03	1.5	1-4E Drift
1-103	0.025	1.2	1-7E Drift
1-104	0.01	1.3	1-7E Drift
1-105	0.02	3	1st level, main cross-cut
1-106	0.27	2	1st level, main cross-cut
1-107	0.17	3.5	1-6W Drift
1-108	2.78	3	1-6W Drift
1-109	1.87	2.9	1-6W Drift
1-110	0.015		) From pit on surface
1-111	Trace		) above 1-6E Drift
1-112	0.015		)
1-113	11.17		) From pit on
1-114	2.29		) West Zone
1-115	7.12		)
2- 1	0.97	5	Cross-cut E end 2-6E Drift
2- 2	1.84	5	2-6E Drift
2- 3	0.70	5	2-6E Drift
2- 4	2.85	5	2-6E Drift
2- 5	1.24	5	2-6E Drift

(1) Assays from assay certificates of Sudbury Assay Office; to Primrock Mining and Exploration, Limited, dated October 15, 1969.

(2) Samples collected by L. J. McCarthy, Vice-President, Primrock Mining and Exploration, Limited. Widths from L. J. McCarthy. Samples are chip samples where widths are listed, otherwise they are grab samples.

<u>Sample No.</u>	<u>Gold, oz/ton</u>	<u>Width, ft.</u>	<u>Location</u>
2- 6	0.73	4	2-6E Drift
2- 7	0.40	4	2-6E Drift
2- 8	0.04	4.5	2-6E Drift
2- 9	1.20	4.5	2-6E Drift
2-10	1.48	4.6	2-6E Drift
2-11	0.12	4.6	2-6E Drift
2-12	1.70	4.3	2-6E Drift
2-13	0.05	4.7	2-6E Drift
2-14	0.65	4.7	2-6E Drift
2-15	0.50	5	2-6E Drift
2-16	0.07	4	2-6E Drift
2-17	0.06	4	2-6E Drift
2-18	0.01	4.2	2-6E Drift
2-19	0.025	4.2	2-6E Drift
2-20	0.02	5	2-6E Drift
2-21	1.90	5	2-6E Drift
2-22	1.10	1	Cross-cut, E end 2-6E Drift
2-23	0.01	1	Cross-cut, E end 2-6E Drift
2-24	0.30	1	Cross-cut, E end 2-6E Drift
2-25	0.01	1	Cross-cut, E end 2-6E Drift
2-26	0.015	4.3	2-6E Drift
2-27	0.07	4	2-6E Drift
2-28	0.95	4	2-6E Drift
2-29	2.69	4	2-6E Drift
2-30	0.02	4.3	2-6E Drift
2-31	1.24	4.5	2-6E Drift
2-32	0.05	3.7	2-6E Drift
2-33	0.11	3.6	2-6E Drift
2-34	0.04	3.9	2-6E Drift
2-35	0.025	5	2-6E Drift
2-36	0.02	1	2-4E Drift
2-37	0.35	1.2	2-4E Drift
2-38	0.09	1	2-4E Drift
2-39	0.36	3	2-6E Drift
2-40	0.015	1	2-4E Drift
2-41	1.21	1	2-4E Drift
2-42	0.015	1.5	2-7E Cross-cut
2-43	0.015	3	2-6E Drift
2-44	1.02	3	2-6E Drift
2-45	3.99	1.5	2nd level, main cross- cut

<u>Sample No.</u>	<u>Gold, oz/ton</u>	<u>Width, ft.</u>	<u>Location</u>
2-46	1.45	5	2-6E, at 2-13E. Cross-cut
2-47	0.41	5	2-6E, at 2-13E. Cross-cut
2-48	0.005	5	2-6E, at 2-13E. Cross-cut
2-49	0.02	4.8	2-6E, at 2-13E. Cross-cut
2-50	0.015	4	2-6E, at 2-13E. Cross-cut
2-51	0.85	4	2-6E, at 2-13E. Cross-cut
2-52	0.75	5	2-6E, at 2-13E. Cross-cut
2-53	0.06	3	2-6E Drift
2-54	0.02	3	2-6E Drift
2-55	2.62	3	2-6E Drift
2-56	0.01	3	2-6E Drift
2-57	0.31	3	2-6E Drift
2-58	1.32	3	2-6E Drift
2-59	0.40	3	2-6E Drift
2-60	0.19	4	2-6E Drift
2-61	1.75	4.4	2-6E Drift
2-62	0.25	3	2-6E Drift
2-63	0.08	3.2	2-6E Drift
2-64	0.13	3.4	2-6E Drift
2-65	1.77	3	2-6E Drift
2-66	9.33	3.5	2-6E Drift
2-67	0.03	2.8	2-6E Drift
2-68	0.06	3.1	2-6E Drift
2-69	0.05	3.4	2-6E Drift
2-70	0.09	3	2-6E Drift
2-71	0.06	2.5	2-6E Drift
2-72	1.51	3.2	2-6E Drift
2-73	2.35	Approx. 2	2-6E Drift
2-74	1.86	Approx. 2	2-6E Drift
2-75	0.80	Approx. 2	2-6E Drift
2-76	0.02	Approx. 2	2-6E Drift
2-77	1.99	Approx. 2	2-6E Drift
2-78	1.81	Approx. 2	2-6E Drift
2-79	1.35	Approx. 2	2-6E Drift
2-80	0.08	2	2-17N Drift
2-81	4.39	3	2-15W Drift
2-82	0.06	.25	2-16N Cross-cut
2-83	0.02	2	2-20W Drift
2-84	2.81	2	2-20W Drift
2-85	1.31	1.4	2-20W Drift
2-86	0.10	2	2-15W Drift
2-87	0.64	1	2-6W Drift
2-88	0.46	1	2-6W Drift
2-89	0.18	1.5	2-15W Drift
2-90	0.025	From muck pile	2-15W Drift
2-91	0.20	2	2-15W Drift



APPENDIX II

References

Reports

- Holbrooke, G. L. 1937. Short report on Hiawatha Mines Limited; private report to Erie Canadian Mines, Limited.
- James, W.F. 1938. Report on Hiawatha Gold Mines Limited.
- Ontario Department of Mines, 1938, Annual Report, vol. 47, part 1, table facing p. 10.
- Ontario Department of Mines, 1940, Annual Report, vol. 49, part 1, p. 18 and 125 - 126.
- Ontario Department of Mines, 1941, Annual Report, vol. 50, part 1A, table facing p. 8.
- Smith, D. E. 1967. Report on the property of Primrock Mining and Exploration Limited, Lizar Township, District of Algoma, Ontario. December 5, 1967.

Maps

- Ontario Department of Mines: map 1958b, Geological Map of Ontario.  
map P.476, Hornepayne Sheet.

News Releases

- Articles in Northern Miner, Feb. 25, 1937, to Nov. 13, 1939.

Correspondence

- Letter from R. I. Ferguson to I. W. C. Solloway, Oct. 24, 1938, concerning developments at Hiawatha Gold Mines, Limited.

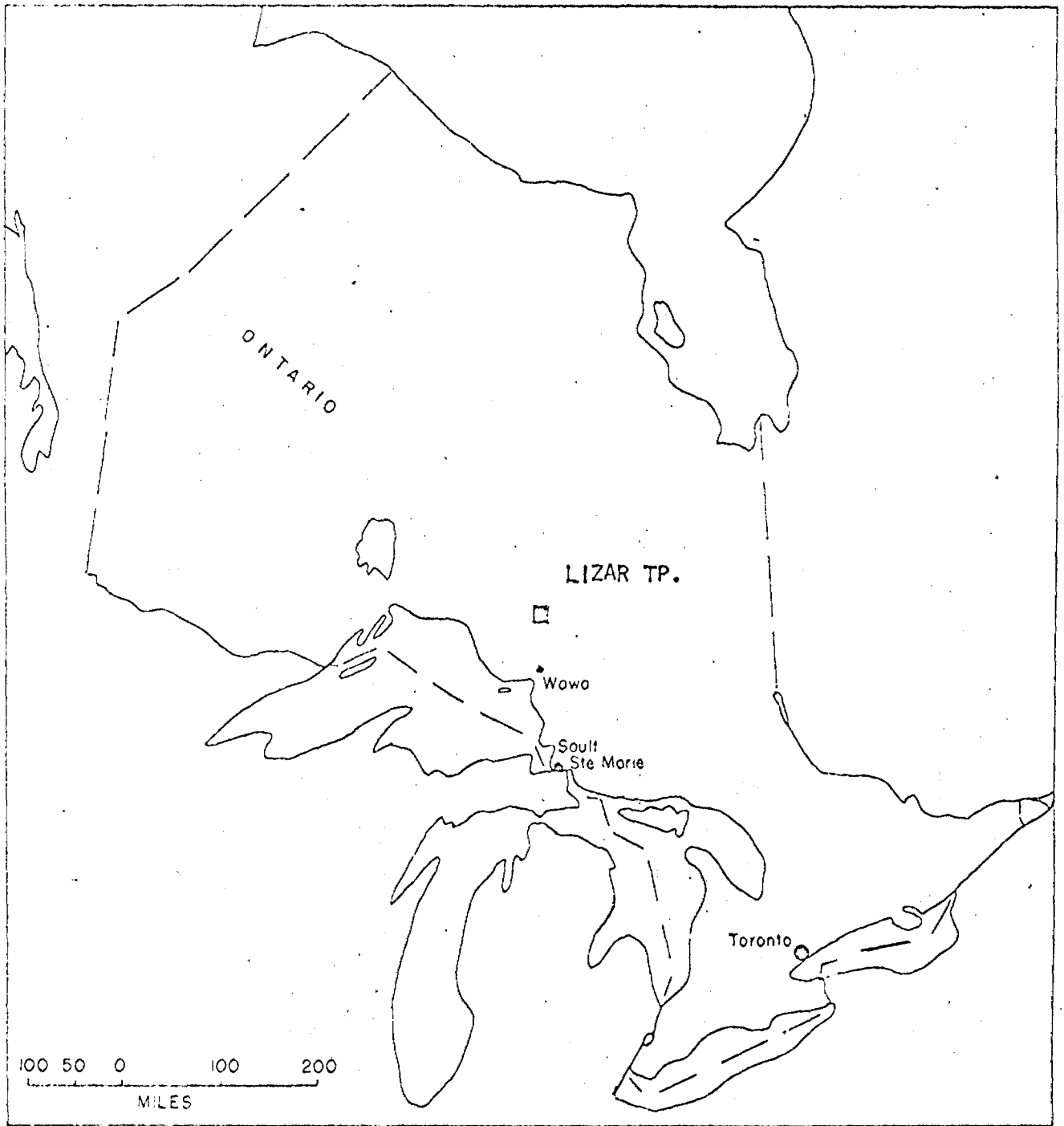


FIGURE I  
LOCATION OF AREA

THE TOWNSHIP  
OF

# LIZAR

DISTRICT OF  
ALGOMA

SAULT STE. MARIE  
MINING DIVISION

SCALE: 1-INCH = 40 CHAINS

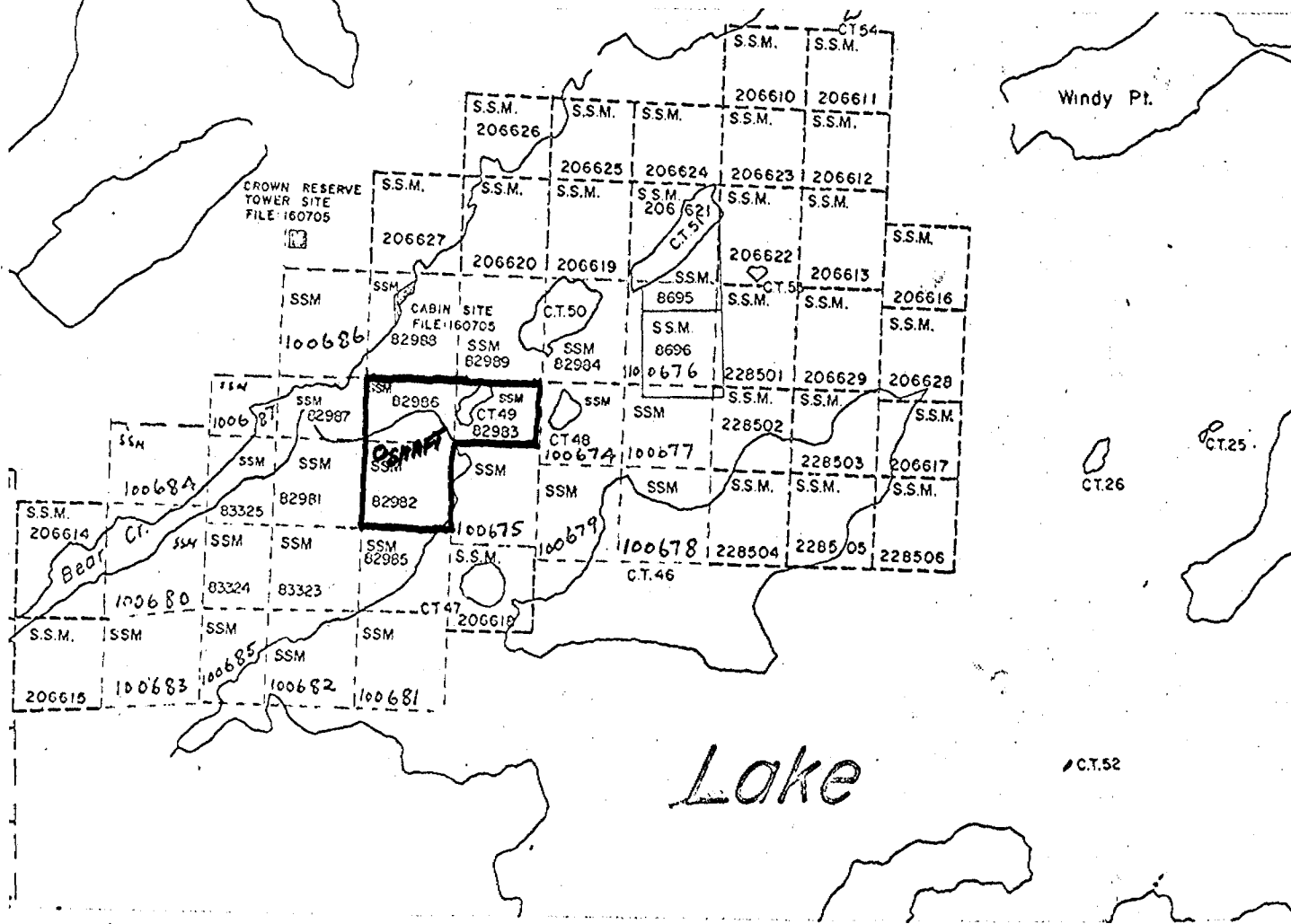


FIGURE 2

CLAIM MAP OF PROPERTY

APPLICANT Prismrock Mining & Exploration Ltd.  
 AREA Lizan Township/District Algoma  
 CLAIM NOS. 100674-87 incl.

SAMPLING DATA

ANALYSIS DATA

Sampling dates June 12/69 to Oct. 15/69 Analysis dates ..... to .....  
 Samplers Boyd, McCarthy, Horne, McCarthy, Allan, Johnston, Beno, Jani Analyst(s) .....

Sample Material .....  
 Average Sample Weight 2 lbs.  
 Method of Collection Chip Sample  
 Soil Horizon Sampled .....  
 Horizon Development .....  
 Sample Depth 150' - 275' to Surface  
 Terrain .....  
 Drainage Development .....  
 Estimated Range of Overburden Thickness 0

ANALYTICAL METHODS

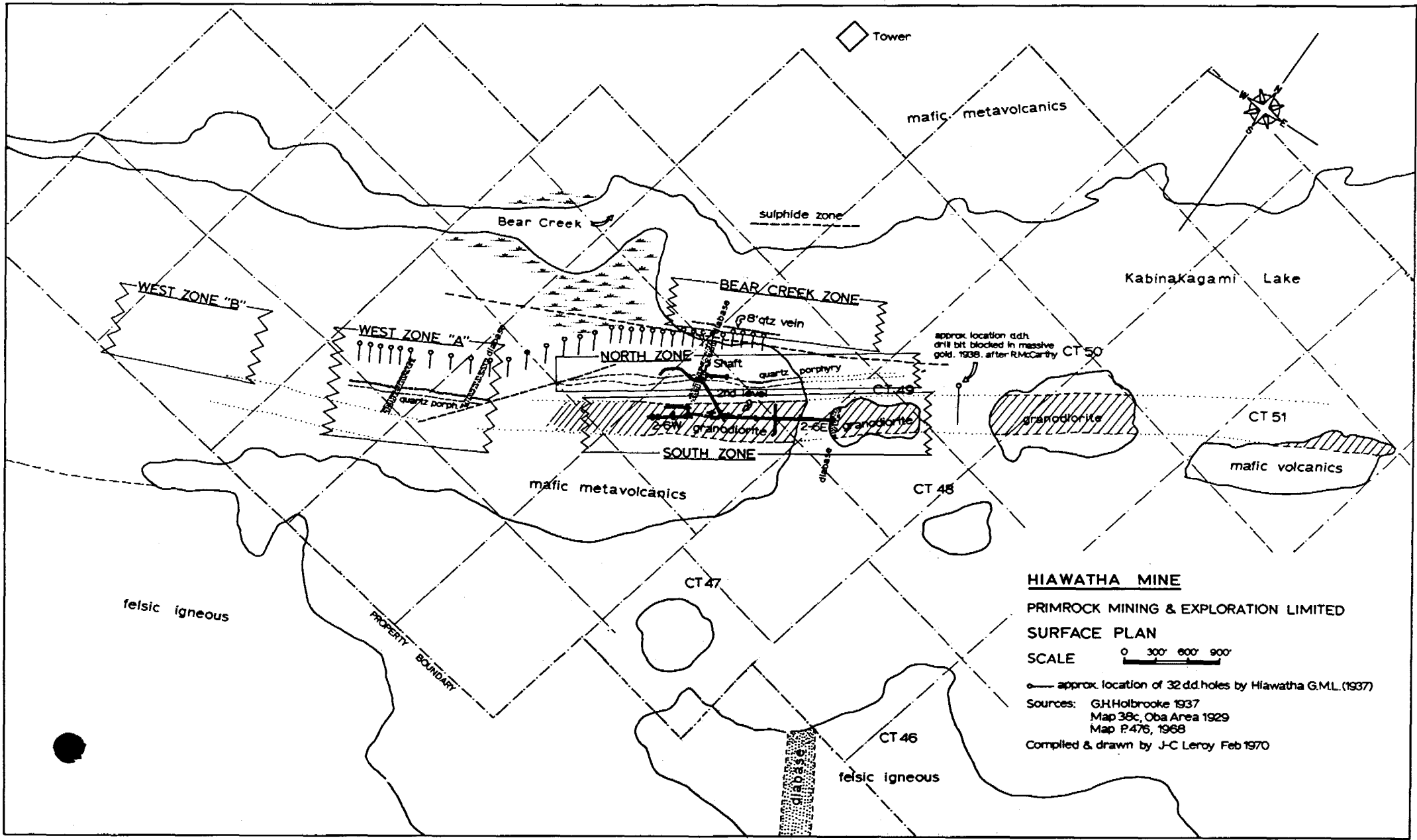
Values expressed in: per cent  
 p.p.m.  
 p.p.b.  
 Cu, Pb, Zn, Ni, Co, Ag, No, As.  
 Others .....  
 Field Analysis ( ..... tests)  
 Extraction Method .....  
 Analytical Method .....  
 Reagents Used .....  
 Field Laboratory Analysis ( ..... tests)  
 Extraction Method .....  
 Analytical Method .....  
 Reagents Used .....

SAMPLE PREPARATION

(Includes drying, screening, crushing, ashing)  
 Mesh size of fraction used for analysis .....  
 General .....

Commercial Laboratory ( ..... ) tests  
 Name of Laboratory .....  
 Extraction Method .....  
 Analytical Method .....  
 Reagents Used .....

COMMENTS Any further information concerning this questionnaire should be in report and plans submitted



**HIAWATHA MINE**

PRIMROCK MINING & EXPLORATION LIMITED  
SURFACE PLAN

SCALE 0 300 600 900'

— approx. location of 32 d.d. holes by Hiawatha G.M.L. (1937)

Sources: G.H. Holbrooke 1937  
Map 38c, Oba Area 1929  
Map P476, 1968

Compiled & drawn by J-C Leroy Feb 1970

# HIAWATHA MINE

PRIMROCK MINING & EXPLORATION LIMITED

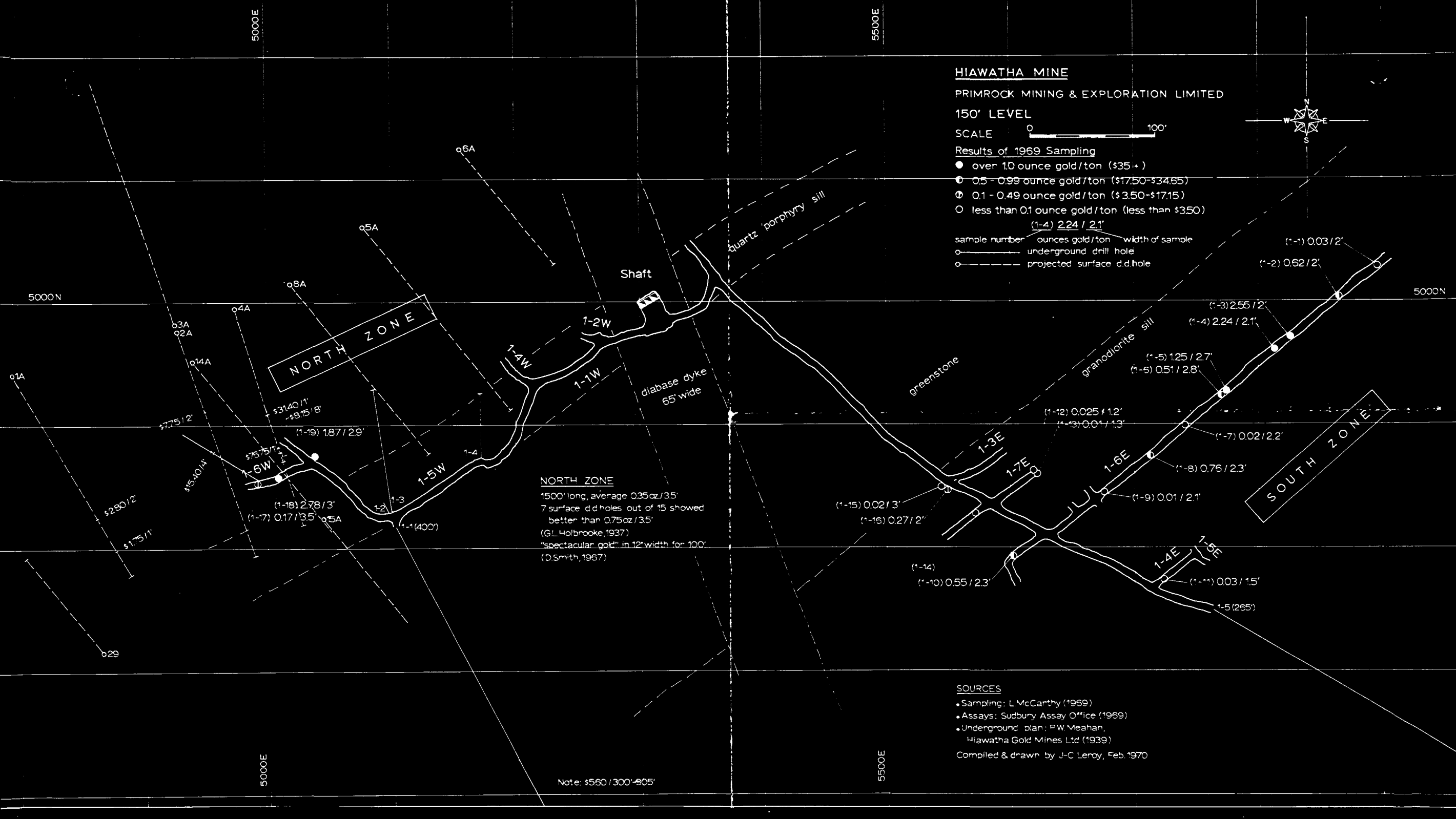
150' LEVEL

SCALE 0 100'

Results of 1969 Sampling

- over 1.0 ounce gold/ton (\$35+)
- ◐ 0.5 - 0.99 ounce gold/ton (\$17.50-\$34.65)
- ◑ 0.1 - 0.49 ounce gold/ton (\$3.50-\$17.15)
- less than 0.1 ounce gold/ton (less than \$3.50)

(1-4) 2.24 / 2.1'  
 sample number ounces gold/ton width of sample  
 ○ underground drill hole  
 ○ projected surface d.d.hole



**NORTH ZONE**

**SOUTH ZONE**

**NORTH ZONE**  
 1500' long, average 0.35oz/35'  
 7 surface d.d.holes out of 15 showed better than 0.75oz/35'  
 (G.L.Holbrooke, 1937)  
 "spectacular gold" in 12' width for 100'  
 (D.Smith, 1967)

**SOURCES**  
 • Sampling: L. McCarthy (1969)  
 • Assays: Sudbury Assay Office (1969)  
 • Underground plan: P.W. Meahan, Hiawatha Gold Mines Ltd (1939)  
 Compiled & drawn by J.C. Leroy, Feb. 1970

Note: \$560 / 300' - 805'

# "Claim Map"

THE TOWNSHIP OF

## LIZAR

DISTRICT OF ALGOMA

SAULT STE. MARIE MINING DIVISION

SCALE: 1-INCH = 40 CHAINS

### LEGEND

PATENTED LAND	⊙
CROWN LAND SALE	⊙
LEASES	⊙
LOCATED LAND	Loc.
LICENSE OF OCCUPATION	L.O.
MINING RIGHTS ONLY	M.R.O.
SURFACE RIGHTS ONLY	S.R.O.
ROADS	—
IMPROVED ROADS	—
KING'S HIGHWAYS	—
RAILWAYS	—
POWER LINES	—
MARSH OR MUSKIE	—
MINES	—
CANCELLED	—

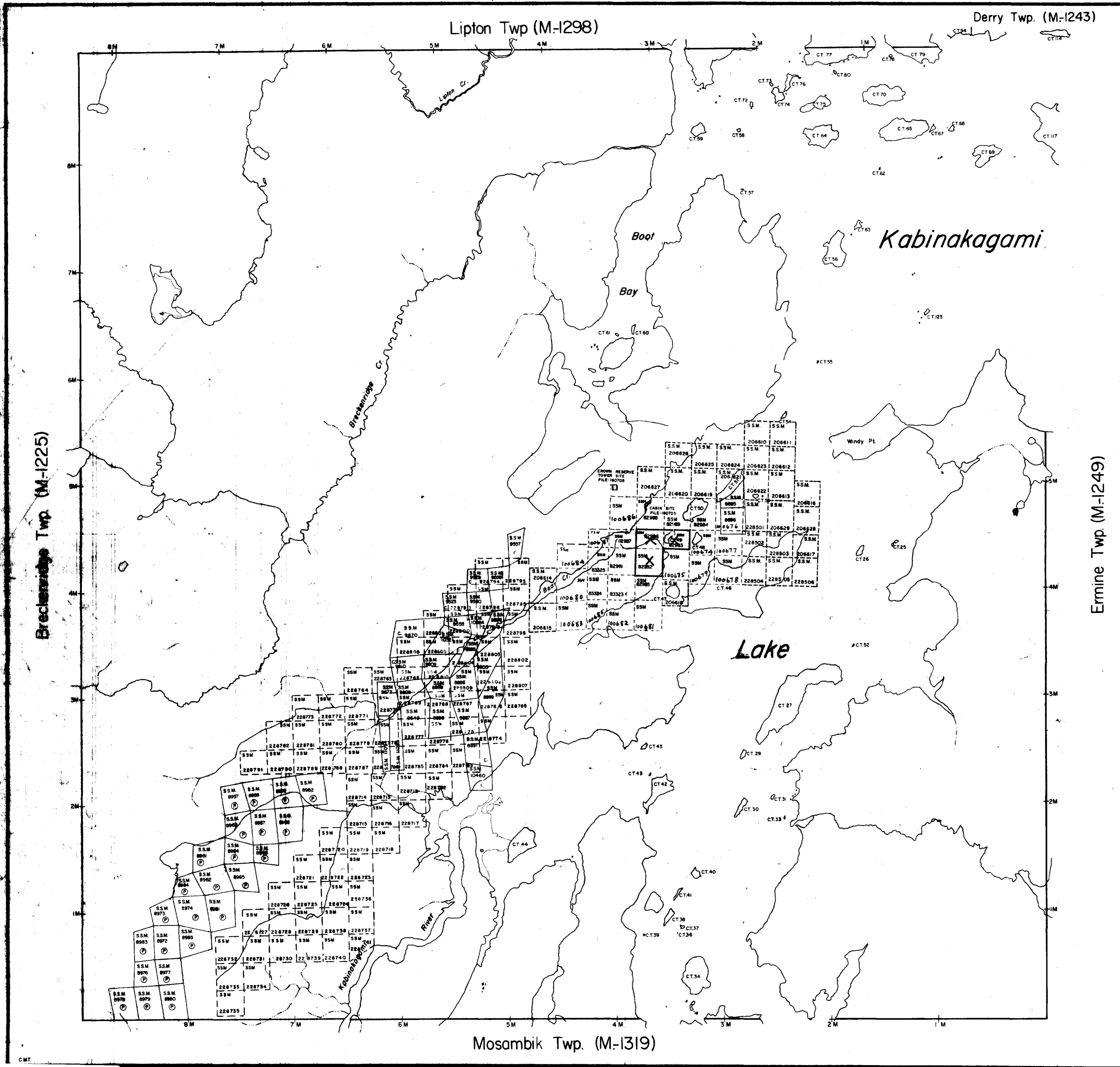
### NOTES

400' Surface Rights Reservation around all Lakes and Rivers.

**DATE OF ISSUE**  
MAY 26 1911  
ONTARIO DEPT. OF MINES

PLAN NO. M.1299

DEPARTMENT OF MINES  
- ONTARIO -



Ermine Twp. (M-1249)



NORTH ZONE

**BEAR CREEK ZONE**  
Located 500' north of shaft  
target of major importance  
dip 25° intersected  
fault zone at 110'  
mineralized zone 448' x 140' (3' wide)  
grade 0.01% to 0.1%  
(R. Ferguson, W. James, 1963)

**WEST ZONE** (located 1/2 mile from shaft)  
220' long, 35' wide  
4 old holes, 50' apart ran better than 15 oz gold/ton  
(see table on p. 104)  
2nd hole 1/2 mile from shaft, ran 0.27 oz / 21'  
& 0.47 oz / 22' true widths  
(see table, 1963)

**HIAWATHA MINE**

PRIMROCK MINING & EXPLORATION LIMITED

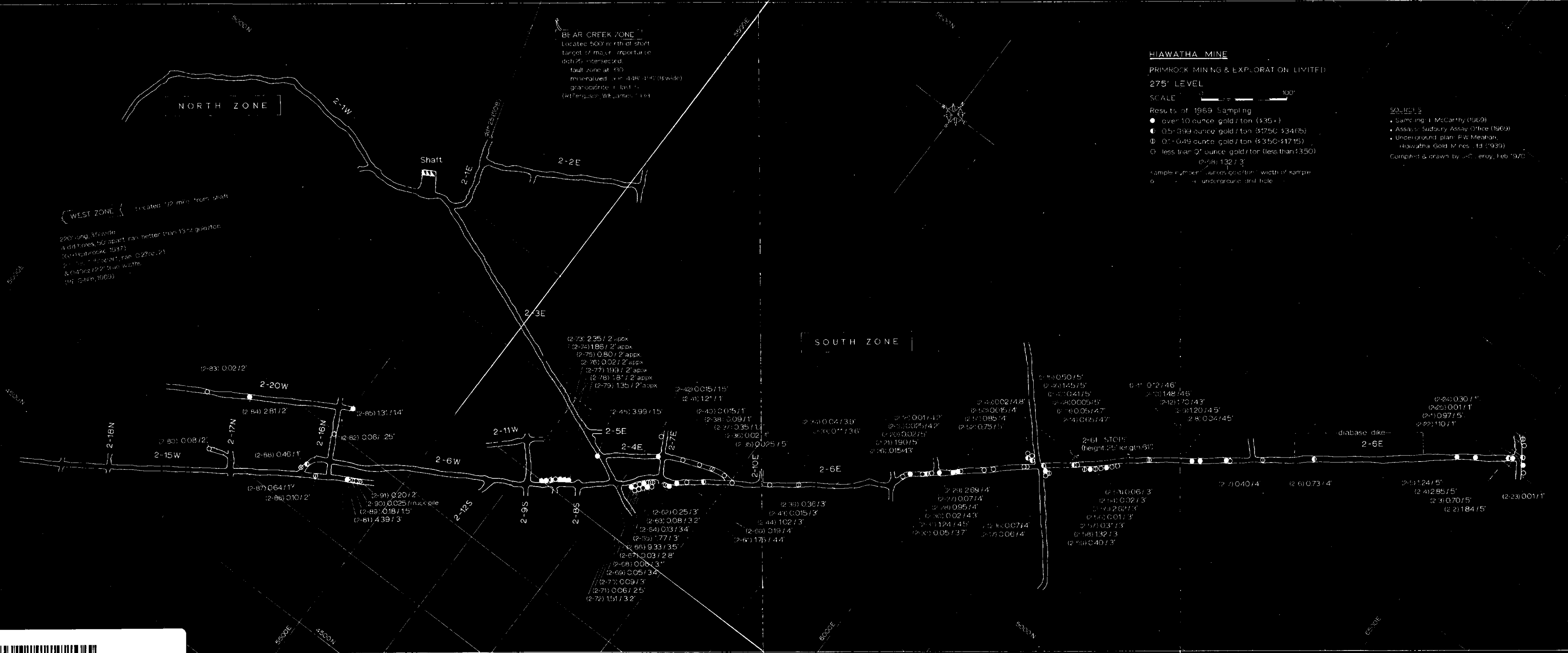
275' LEVEL

SCALE 1" = 100'

Results of 1969 Sampling  
● over 10 ounce gold / ton (\$35+)  
● 0.5-3.99 ounce gold / ton (\$1750-\$3465)  
○ 0.1-0.49 ounce gold / ton (\$350-\$1715)  
○ less than 0.1 ounce gold / ton (less than \$350)  
○ 0.88: 132 / 3'  
\* Sample number (ounces gold/ton) width of sample  
○ = underground drill hole

**SOURCES**  
• Sampling: J. McCarthy (1969)  
• Assays: Sudbury Assay Office (1969)  
• Underground plan: F.W. Meahan,  
Hiawatha Gold Mines Ltd (1939)  
Compiled & drawn by: J.C. Leroy, Feb 1970

SOUTH ZONE



42C16SW0015 63E.27 LIZAR