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DEPARTMENT OF MINES

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JUN 27 1963

TO

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REPORT ON  
THE GAUDAUR PROPERTY  
COBALT AREA - TIMISKAMING MINING DIVISION  
DISTRICT OF TIMISKAMING - ONTARIO

INTRODUCTION

In January 1963 Nama Creek Mines Limited acquired six unpatented mining claims in an area located in the northwest part of Lorrain Township, 4 miles southeast of the town of Cobalt, Ontario. The main feature of interest on the claims was a calcite vein reported through the former owners (in the "Davis Handbook" 1910) to contain silver in quantities ranging from a low of 3 ounces to a high of 200 ounces per ton. To explore this vein, the Crysler Niles Mining Company (incorporated in 1908) sank a vertical 7' x 14' shaft to a depth of 200 feet. The shaft was reported to have followed one vein for 97 feet before it dipped out of the shaft's north wall. These reported qualities and some revised conceptions regarding the possible structure and depth of the Nipissing diabase intrusive sill, which were introduced by the writer, added strength to the Company's decision to acquire and further explore the mineralized occurrence, and the validity of the early reported silver values.

Nama Creek Mines Limited has recently completed the dewatering of the shaft to a depth of 101 feet, and the sampling and mapping of the several calcite veins exposed in the west wall, was carried out by the writer.

The results of this examination were inconclusive, inasmuch as although only one vein was mentioned in the early reports, four were actually found to be present but in sampling certain of these, no silver values exceeding 0.16 ounces per ton were obtained. The veins, composed of pink to white calcite, had widths up to 6 inches and were followed from depths of 20 feet to 80 feet, where they left the shaft but were still continuing quite strongly on their dip. Three of the veins on a strike bearing of N65°E and a dip of 80° northwest, cut across the northwest corner of the shaft in the manway compartment. The fourth vein on a strike of N65°W was found in both the west and east end walls of the shaft. This vein dipping, 80°NE passed into the north wall at about 70 feet and was observed at this depth to occupy a strong gouge filled slip, which forms the north wall of the shaft from a depth of 65 to 75 feet. This vein appears to be crossed and possibly offset by the others. All the veins are occasionally mineralized strongly with chalcopyrite and less pyrite.

Similar veins at neighboring properties such as The Deer Horn and Silvermaque are known on strike and dip to progress from barren areas into sections containing cobalt silver mineralization. This is a probability suggested for the "Crysler Niles" veins on the Gaudaur Property and it is recommended that such a possibility be tested by diamond drilling the vein system to greater depth and along strike. However, it was understood that if Nama Creek Mines Limited did not favour this procedure, then the claims were to be returned to the ownership of Mr. John Gaudaur in fulfilment of his

stipulation as included in the original purchase agreement. The claims were restored to Mr. Gaudaur early in May 1963.

#### THE PROPERTY

The Gaudaur property is comprised of six unpatented mining claims of about 40 acres each, located in the western part of Concession 10, Lorrain Township. Specifically the claims are:

52043 The SE 1/4 of the N 1/2 of Lot 2, Concession 10, Lorrain Township

50760 The NE 1/4 of the S 1/2 of Lot 2, Concession 10, Lorrain Township

51968 The SW 1/4 of the N 1/2 of Lot 3, Concession 10, Lorrain Township

49381 The SE 1/4 of the N 1/2 of Lot 3, Concession 10, Lorrain Township

51926 The NE 1/4 of the N 1/2 of Lot 3, Concession 10, Lorrain Township

52056 The NW 1/4 of the S 1/2 of Lot 3, Concession 10, Lorrain Township

Which presently bear the recording numbers T52043 - 50760 - 51968 - 49381 - 51926 - 52056.

#### LOCATION

The Gaudaur property is located 4 miles by Highway 567 and 2 miles by truck road from the town of North Cobalt, a point on Highway 11 and the Ontario Northland Railway. Water and hydro electric power are available from sources located not more than one mile distant from the Chrysler Niles shaft. In the spring and fall, surface water is readily available near the shaft and a sump would preserve this for several months during the dry mid - summer.

## GENERAL GEOLOGY

The Cobalt area is world famous for its silver production which to the present time has exceeded 400 million ounces. Most of this was produced rapidly between the years 1907 and 1920. If glacial and other erosion had not removed the first several hundred feet of valuable ore from above the present surface of the known deposits, it is estimated that by this time Cobalt might have produced approximately one billion ounces of silver. As most of the silver that was mined came from ore deposits which occurred underneath <sup>THE</sup>/flat lying body of the Nipissing Diabase, it is considered reasonable to assume that more deposits of great value still exist and remain to be discovered under this widespread sill like intrusive (below the sill where it yet remains preserved from removal by erosion). Such an area is believed to be that in which the Gaudaur property of Lorrain Township is located. Other present surface areas, which once occurred only a few hundred feet below the now eroded diabase sill, may also contain undiscovered silver.

The geology of the Cobalt area is relatively uncomplicated but the location of new silver deposits in this simple structure is a relatively difficult problem, involving much detailed exploration and the old timers "nose" for ore. The recommended procedure is well described in the Canadian Mining Journal, November 1959.

The oldest rocks in the area are of those volcanics and sediments of The Keewatin Period. These were intruded by batholithic to boss-like masses of Lorrain granite of The Algoman Period. These two members of Pre-Cambrian Time were peneplained and most of their hills and valleys were unconformably overlain by formations of The Huronian Period, known as the Lower Cobalt Series of sediments. In the Cobalt area the most important member of this series, from an economic standpoint, is the Lower Cobalt conglomerate.

Of the silver mined in the vicinity of the town of Cobalt, 77% came from vein deposits that occurred in this rock formation. About 13% came from veins in the underlying Keewatin formations, and 10% from the diabase which intruded both these older types of rock.

The Nipissing Diabase Sill occurs as an undulating horizontal sheet of up to 1,000 feet in thickness, which covers the Cobalt sediments, if present, or plunges down through them and occasionally intrudes the Keewatin volcanics below.

In this geological setting, the factors controlling the formation of veins and the deposition of silver ore in the Cobalt and related area, are as follows:

1. THE DIABASE SILL

It is generally understood that the deposition of the ore shoots is related in some manner to the diabase sill, and although this may only be a structural relationship, no silver shoots have been found more than 500 feet from the contacts of the sill. Ore shoots occur in vein systems which form isolated

ore centres located below, and/or above and/or in the diabase sill.

## 2. THE CONTACTS

There are three contacts along which the silver ore shoots have been found. One of these contacts is that occurring between the Keewatin volcanics and Cobalt Sedimentary Series. Generally the most ore occurs in the Cobalt conglomerates within a distance of 200 feet above the Keewatin contact but also in places continues in the veins which pass down into the Keewatin Rocks.

Another contact controlling ore location is the top of the diabase sill, also referred to as the "Upper Contact". The diabase sill in its thrust of intrusion has pitched and rolled, in places overriding the Cobalt Series with arches or domes of its bottom or "Lower Contact" and again cutting down through the Cobalt formations and even down into the basement of Keewatin volcanics and Algoman granite, engulfing huge bodies of these rocks in troughs or basin-like depressions of the top or "Upper Contact". At times, in doing this, huge blocks have been torn away and enveloped as xenoliths or inclusion in the diabase. Veins occurring in these older rocks of the basins often extend down through the contact into the younger diabase below. In the New Lake Basin, and South Lorrain Basin, most ore shoots occur in veins located in the older keewatin rocks above the diabase contact.

However, under similar structural condition at Gowganda, the strongest veins are developed in the underlying sill and occur quite insignificantly in the Keewatin formations.

The third contact controlling the formation of silver ore centres, their vein systems and ore shoots is the bottom contact of the diabase sill, which is usually referred to as the "Lower Contact". Silver veins developed in the vicinity of this contact may start in the diabase, pass down and through the underlying Cobalt formation if present, and into the basement of The Keewatin Period rocks. Here again ore shoots have limits which do not usually extend beyond 500 feet from the diabase contact, although the veins generally still continue some considerable distance beyond these silver bearing portions. Veins developed at this contact formed the highly productive deposits which were mined at the Coniagas, Tretheway, Nipissing and other mines around the town, and made Cobalt such an important silver producing area.

### 3. FAULTS

Another factor governing the deposition of silver veins is the occurrence of faults older than the veins. The silver solution did not generally deposit in the major faults but within joint planes and minor fractures close to the major displacements. However, some ore shoots have been found in some portions of major faults such as "Wood's Fault" in South Lorrain Township and "Fault Number 64" on the Nipissing property.

4. DEPRESSIONS (OR DOMES) IN THE DIABASE SILL

A large number of the vein systems of ore centres occur in the older formation lying above depressions or "basins" on the "Upper Contact" or below domes or "arches" of the "Lower Contact". These basins and arches have probably been caused by undulations in the sill during intrusion. Such large indentations in an otherwise plane-like surface of the diabase contacts have definitely controlled ore deposition. Minor flexures or monocline-like "rolls" within these broader indented features have had a still more immediate localizing effect. Notable examples of this control are the Beaver and Nipissing Mine vein systems in a part of the New Lake Diabase Basin or the University and Crown Reserve Mines of the Kerr Lake Arch.

5. IRON FORMATION

This name is applied to interflow sedimentary horizons occurring in the Keewatin volcanic series which is so prominent in the Cobalt area. These slate and chert beds usually contain sulphides, generally pyrite, with some chalcopyrite, sphalerite and galena.

On some properties it has been found that some veins in the Cobalt Series correspond to the beds of sediments in the Keewatin Series below. This control even extends to the strike and dip of the veins concerned.



## 6. GEOLOGY OF THE PROPERTY

The rock outcrops observed on a large portion of the claims and inspection of Thomson's geological map, indicate that the Gaudaur property largely overlies diabase except in the southwest portions of one claim, where Lorrain granite is predominant.

In the southwest part of the southwest claim of the property, the Nipissing diabase has plunged down under Lorrain granite to form the northeast rim of the New Lake Diabase Basin. No knowledge of the attitude of the diabase contact is available in this area, however, as mentioned in the chapter on conclusions, the dip is probably steep.

Original inspection in the vicinity of the Chrysler-Niles has located numerous outcrops of coarse grained, grey green diabase particularly as a prominent northeast trending ridge which parallels a shallow valley located immediately northwest of the shaft. The shaft itself is located on a small knoll of the same formation, lying at a somewhat lower elevation and terminated by a broad, flat drift-filled valley on the southeast side. These and other topographic features are shown on the accompanying geological map which has been taken from a report published recently by Robert Thomson, for the Ontario Department of Mines.

Near the Chrysler-Niles shaft, little is known regarding the true thickness of the uneroded remains of the Nipissing Diabase Sill. The shaft is reported to have penetrated the sill to a depth of 200 feet. The author inspected the first 101 feet which was recently exposed by the dewatering of the shaft to that depth.

Consequently, the present thickness of the nature of the formations, which underlie the sill at this locality, are almost entirely a matter for conjecture. The only indirect knowledge of this situation is that taken from the reports on the Brady Cross Lake claims which are located in a similar environment about one mile to the west of the Chrysler-Niles shaft. Here the diabase sill has a remaining uneroded thickness of 500 feet, an almost horizontal dip in the northsouth direction and is underlain by from 45 to 183 feet of Cobalt Series sediments including conglomerate, grit and greywacke. Thomson believes these sediments to have been derived in part from the disintegration and erosion of the Lorrain granite and Keewatin volcanics. This detrital matter was deposited in a nearby Pre-Huronian trough in these older formations. The south boundary of such a trough is also suggested at the present land surface as mapped by Thomson in an area lying about 2,600 feet east of the Chrysler-Niles shaft. These two determinations would suggest the possibility that some remnant of Cobalt sediments may occur below the diabase sill in the claims immediately surrounding the Chrysler-Niles shaft area. The thickness of the diabase sill at this point is left to the interpretive processes of the reader. The writer's contention is that it should not exceed 400 feet.

7. GEOLOGY OF THE CRYSLER-NILES SHAFT

This excavation is a 7' x 14' vertical shaft which was apparently sunk to explore the character of a carbonate vein system occurring in Nipissing diabase on the northwest slope of a low ridge. The long axis of the shaft has a bearing of N65°W. At a point starting 20 feet below the collar the veins are now exposed in the northwest corner of the shaft and on the west wall. The walls of the shaft are a much jointed blocky, coarse grained diabase. Vertical to flat slips with northeasterly and northwesterly trends are quite numerous.

Three of the veins seen on the west wall of the shaft have a parallel strike of N65°E, dip 80° to the northwest and occur en echelon with a separation of about 2 feet. For the most part, the diabase walls are quite tight although chloritized. This set of veins is crossed by a fourth vein which on the west wall appears rather insignificant by contrast, but which on the east wall increases in magnitude. This vein strikes N65°W, dips 80° northeast and its walls are quite sheared in places. This shear slip and gouge have formed a prominent slip-like wall on the north side of the shaft from the 65 to 75 foot point in depth. At 60 feet, as seen in the northwest corner, the number four vein is separated from the number one, by about 12 inches of diabase gouge. This condition of the diabase walls in contact with the veins, suggests that one set occurs in the direction of tension fracture, while the fourth vein occurs in the direction in which the resultant of dynamic stress caused shearing in the diabase mass.

Both sets of structures appear to be quite strongly developed and accompanied by numerous parallel slips in the diabase surrounding the veins. Several flat lying joints in diabase were seen to contain thin carbonate stringers.

All the veins in the shaft are composed of calcite, which varies from white, grey to pink. The pink variety is usually much coarser grained and harder than the others, and does not react vigorously to cold dilute HCl. This variety may be a manganiferous type and it is more prevalent in parts of the number one vein than in the others. All veins are in some degree mineralized with chalcopryrite and pyrite. In places, especially in upper parts of the number one vein, the chalcopryrite becomes quite coarse grained and heavily disseminated. The sulphides do not in any case appear to penetrate the enclosing diabase wall rocks, but where weakly developed, do seem to favor the chloritized margins of the vein walls. Chloritic streaks appear to be more prominent between layers of soft, white carbonate in the number four vein. The number one vein gives the impression of being the more strongly developed and mineralized. It attains widths up to 4 inches of heavily mineralized, pink carbonate at a depth around 30 feet. The other veins are from 1 to 2 inches in width.

9. METHOD OF EXAMINATION

The early reports on this occurrence stated that a single vein, having a 5 inch width near surface, increased in width to a depth of 97 feet where it dipped out of the shaft. These reports also stated that samples taken at regular intervals showed the silver content of the vein to vary from amounts of 3 to 200 ounces. To evaluate the validity of these reports, it was decided to dewater the shaft, examine and sample the vein if present. Such a program was commenced in February and completed in April 1963.

Veins Number 1 and 2 were sampled continuously by the writer for lengths of 25 to 35 feet, in sections of about 4 feet along the vein on dip. Details of this sampling are shown in an accompanying section drawn at a scale of 1 inch equals 2 feet. The sampling indicated that the silver content in these sections of the veins varied from nil to 0.09 ounces per ton. Two similar samples were taken from the Number 4 vein in the east wall of the shaft from the hoising compartment, and here silver values were traced at 0.16 ounces per ton. Faced with these contradictory results it was felt that further sampling was futile in these reaches of the vein system. The details of sampling are tabulated on next page.

<u>Vein No.</u>	<u>Sampled</u>		<u>Average Width</u>	<u>Ag</u>	<u>Au</u>
	<u>From</u>	<u>To (Ft)</u>	<u>(Inches)</u>	<u>Oz./T</u>	<u>Oz./T</u>
<u>On West Wall</u>					
No. 1	27"	31'	1" to 2"	0.09	
	31'	35'	1" to 4"	0.09	
	35'	38.5'	1" to 2"	0.04	
	38.5'	44'	2" to 3"	Trace	Trace
	44'	49'	2" to 3"	0.03	
	51'	53'	2"	Trace	
	55'	58'	12"	Trace	
No. 2	38.5'	44'	2"	Nil	
	44'	48.5'	2"	Nil	
	49'	54'	1" to 2"	Nil	
	54'	57.5'	1" to 2"	Trace	
	59'	62.5'	1" to 2"	Trace	
	70'	75'	1" to 2"	Nil	
<u>On East Wall</u>					
No. 4	40'	45'	2"	Trace	
	45'	50'	2"	0.16	

#### 10. DIAMOND DRILLING FROM SHAFT

The strongest vein system appeared to be the three veins with a strike of N65°E which cut across the northwest corner of the shaft. On surface, a pronounced lineament with a bearing of N40°E lies immediately northwest of the shaft and separates the shaft outcrop from a strong pronounced diabase ridge located some 75 feet northwest of the shaft. The long axis of the ridge and valley has a bearing more or less parallel to the strike of the vein and this suggested a possible zone of weakness with which the vein system might be associated, and which might contain more and stronger veins with possibly a different and more favorable metallic content.

To test this theory a 101-foot horizontal "EX" core hole was drilled on a bearing of N46°W from the west wall of the shaft at the 85-foot level. This hole intersected the downward and strike extensions of Veins No. 1, 2 and 4 in the interval between 5 and 17 feet from the shaft. Between 2.5 and 36.5 feet at least eleven carbonate filled fractures were intersected, some of them sulphide bearing. From 36.5 to 101 feet the hole cored massive coarse grained diabase cut by occasional joints but no noticeable vein matter. A detailed log of the hole is included in this report. Sludge samples collected every 10 feet assayed trace to nil silver. The veinlets logged between zero and 36.5 feet were carefully inspected for metallics other than chalcopyrite and pyrite and as no silver or cobalt arsenides were apparent the core was not sent for assay. The frequency of carbonate veinlets and several carbonate recemented breccia fractures, which occurred between footage 2.5 to 36.5 would suggest this as a possible zone of weakness, when compared with the more massive diabase which occurred up to 101 feet from the shaft. However, as no encouraging silver content was encountered and as the air drilling procedure was very costly, it was decided that no further drilling could be justified from this immediate location. Thus this stage of the examination was terminated and results were considered to be somewhat inconclusive.

11. CONCLUSIONS

The results of the examination in part both confirm and refute the claims made in the early reports on the Crysler-Niles property and the results may therefore, be said to be rather inconclusive. As anticipated, the dewatering of the shaft revealed not only one vein but four veins. Unfortunately, the reputed silver content was found to have been either fake, or somehow erroneously reported by the early owner to the author of the "Davis Handbook". This erroneous report was repeated in the Ontario Department of Mines preliminary report on the "Geology of the North Part of Lorrain Township".

The veins, where observed in the shaft and leaving the shaft on dip, were still seen to be continuing in fairly strong fracture and shear structures so that there is nothing to suggest that they do not continue strongly on strike and down dip. The pronounced northeast trending lineament formed by the shallow valley and prominent ridge are in some manner associated with a fairly strong fracture system in the diabase and located on the valley's east side, as indicated by the diamond drill hole from the shaft. The lineament may be traced on air photographs for some 2,800 feet on the Gaudaur property, but since it has only been investigated by one diamond drill hole it may only be assumed that fracturing and veining will be associated with it in places along the entire course of the valley. In dealing with the



prospecting possibilities of the lineament the following features are presented as being of additional importance:

In the northeast 1/4 of the south 1/2 of Lot 2, Concession 10, Lorrain Township, the large body of granite which lies to the west has been interpreted by Thomson as a smaller xenolith which has been stoped off from the main granite xenolith which forms the east third of the New Lake Diabase Basin. Thomson suggests that the smaller mass has been torn from the larger and he shows a fault extending into the area which separates the two bodies. The area of separation is mapped as a long narrow dike-like body of Nipissing diabase. Elsewhere in Thomson's report on Lorrain Township he mentions that the attitude of such linear bodies of diabase is often quite steep in contrast to the more flatly dipping contacts around the edge of the basin-like depressions in the larger mass. If this steep dipping attitude of the diabase contact is prevalent around the nose of Lorrain granite in the southwest corner of the Gaudaur property, then this could have an important influence on the thickness of the remaining portion of the diabase sill at this point. It is suggested that a roll-like structure may be prevalent here and that the true thickness of the diabase may not be nearly as great as it would normally be where that close to the rim of a basin in the upper contact. This assumption, if correct, presents promising and feasible possibilities to explore the lower contact region of the diabase sill. However, if this reasoning is erroneous,

it still does not detract greatly from the exploration possibilities of this part of the Gaudaur property.

This conclusion is based on the knowledge that in the nearby Beaver Mine an economically important quantity of silver was deposited in such a xenolithic block of Lorrain granite. Consequently, it is suggested by the writer that the disrupting dynamic forces which tore the smaller xenolith from the main mass would also probably have more than normally shattered and fractured the smaller body, particularly close to its margins and that of the parent mass. Not to pursue this line of reasoning to tiring lengths, it may be briefly pointed out to the reader, that the strong lineation which trends northeasterly past the west end of the Chrysler-Niles shaft may be seen to project into and past the area under discussion. To the writer, this presents excellent possibilities for the location of silver bearing veins in this part of both the upper and lower contact regions of the diabase sill.

The pink carbonate and chalcopyrite mineralization which is prevalent in portions of the veins in the Chrysler-Niles shaft is identical with similar vein material which is found at the nearby Deer Horn Mine and Silvermaque Mine. At these mines such veins although barren in certain sections have been found to develop economic quantities of silver, cobalt mineralization when traced into different horizons on strike and/or dip. Such a possibility is suggested for the Gaudaur property.

12. RECOMMENDATIONS

To test these various untested possibilities for the continuance of the vein structures and an attendant change in mineral content from copper bearing to silver-cobalt bearing, it is recommended that a minimum of 3,000 feet of "AX" core diamond drilling be carried out below the present shaft and along the extensions of the valley and possible lineament referred to above. Such a program will probably have to be preceded by a mapping, prospecting and possible geophysical survey of selected areas within the claims, particularly those located in the southwest portions of the property. Such a program could be efficiently carried out for approximately \$20,000.

Respectfully submitted,



W. F. Morrison, P. Eng.,  
Mining Geologist

Toronto, Ontario  
June 19, 1963.

NAMA CREEK MINES LTD.

PROJECT 447

GAUDAUR PROPERTY - CRYSLER-NILES SHAFT

LORRAIN TOWNSHIP - COBALT AREA ONTARIO

LOG OF DDH. NO, 1 by W.R.Morrison, April 29/63

Hole started: April 15th, 1963

Hole finished: April 25th, 1963

Depth 101.00 feet.

Location: from northwest wall of the Chrysler-Niles shaft (Shaft located at  
at an elevation of 85 feet below surface. (approximately 400ft

Bear: N 46° W true (corrected for mag decl of 10° west). (west of the NE corne

Dip: Horizontal (of claim T 50760, Lot

Core size: EX (1 1/8") (2, Con. 10, Lorrain Twp

Drilling by: R. Cloutier, Cobalt, Ontario - drilling contractor.

FOOTAGE

DESCRIPTION OF CORE

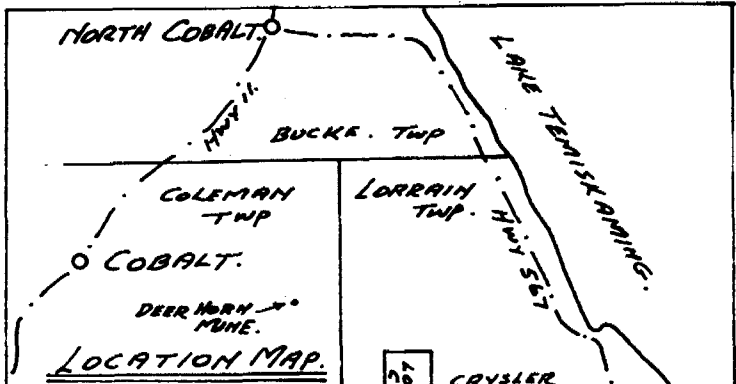
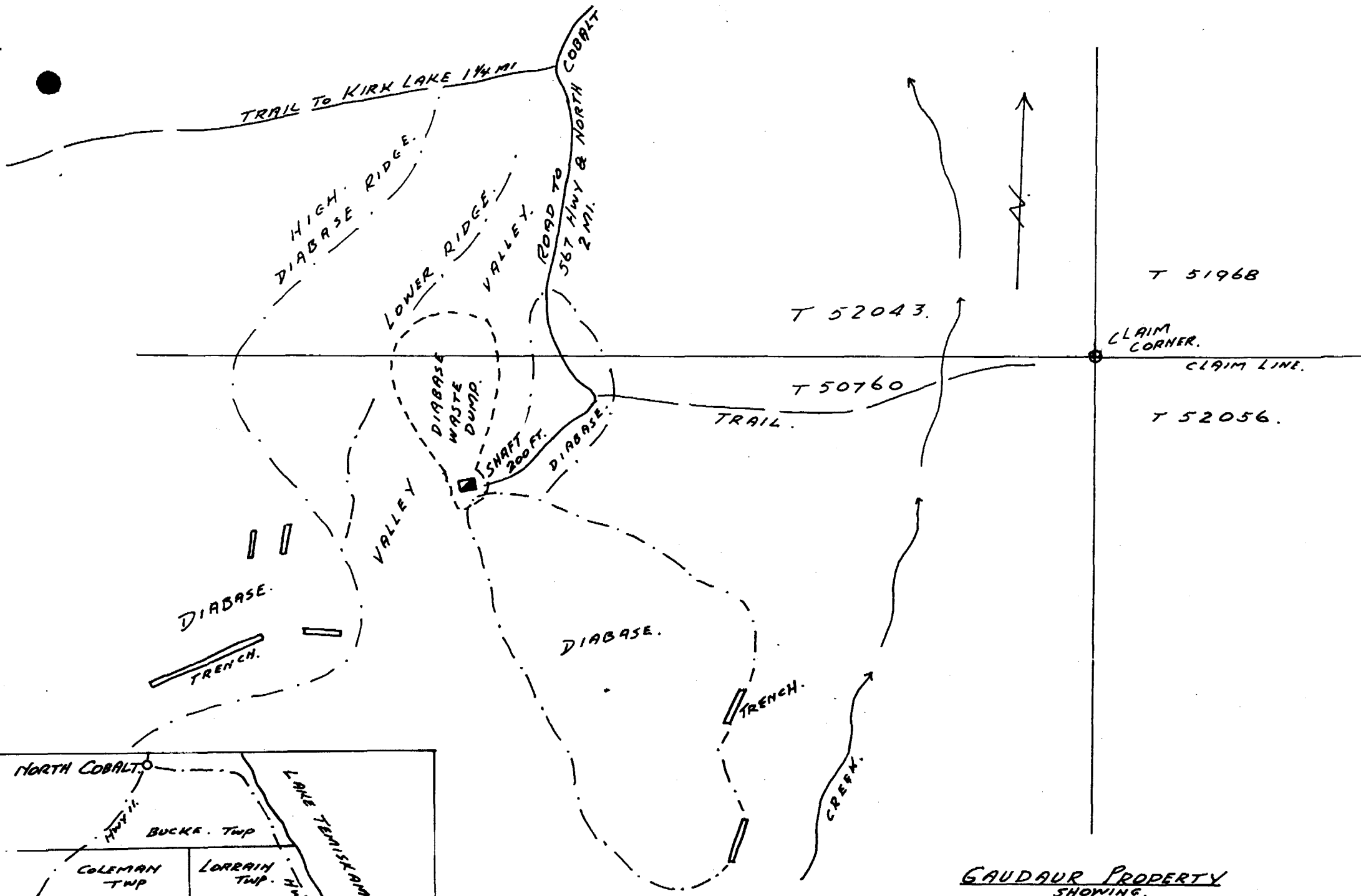
0.00-36.4 Diabase, coarse grained, holocrystalline, grey green colored, rock, massive between fractures, slight variation locally in texture to finer grained sections. Megascopic estimation of composition suggested a rock composed of approximately 60% grey colored basic plagioclase, 40% ferromagnesian minerals, pyroxene, hornblende, minor epidote, chlorite and quartz. Does not display distinct or pronounced ophitic texture.

This section is transected by at least 11 distinct calcite filled fracture, located and described as follows:

At 2.6' 1/4" grey calcite stringer crossing core at 70° to CA (long axis of core).  
5.4' 1/2" same at 80° to CA & containing heavy cp mineralization  
5.9' 1/2" " " 90° " " " moderate pyt "  
7.0' 1/4" " " 70° " " " " "  
All above display more or less frozen walls  
8.2' 1" fg sheared section with chlrite, white calcite, some heavy cp in fract at 45° to CA  
9.6' 1/4" " " no mineralization " " 90° " "  
17.25' " " " sl fg pyt, in " " 80° " "  
21.5' " " " " " " " 45° " "  
All above display more or less frozen walls  
22.25' 1/2" wh calcite recementing fg chlritic breccia, mod pyt min  
22.6' 1/4" sheared chloritic material enclosing 1/8" wh calcite str at 45° to CA, modfg pyt.  
36.35' 1" fract of grey calcite at 90° to CA, minz'd wi sl pyt.

36.4 - 101.00 Massive diabase as above with no obvious indications of deformation by fracturing or shearing.

CONCLUSION: That the first 36.4' represent a fairly strong fracture zone of undetermined strike or dip, but which could be related in this respect to the attitude of the veins in the shaft, some of which are probably represented in this section.



GAUDAUR PROPERTY  
SHOWING.  
THE CRYSLER NILES SHAFT

SCALE 1"=80'

