GM 52360

ASSESSMENT REPORT ON A COMPILATION PROGRAM, LAMAQUE PROPERTY

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TECK EXPLORATION LTD.

NORTH BAY, ONTARIO

ASSESSMENT REPORT
ON
A COMPILATION PROGRAM
ON THE
LAMAQUE PROPERTY

by

K. Thorsen

MER - S.I.S.E.M. 1994/03/24
GM 52360

Report No. 1240NB

N.T.S. 32 C/4

12-16-93

94014046

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INTRODUCTION

During 1993, Teck personnel completed a comprehensive compilation of work done on the Lamaque property in Bourlamaque Township in the Val d'Or area. The primary purpose of the compilation was to develop a strategy to explore the property for base metals given the fact that previous programs had essentially been designed to explore for additional gold reserves.

The following report outlines the history of exploration and mining and discusses the potential for a base metal deposit on the property.

LOCATION & ACCESS

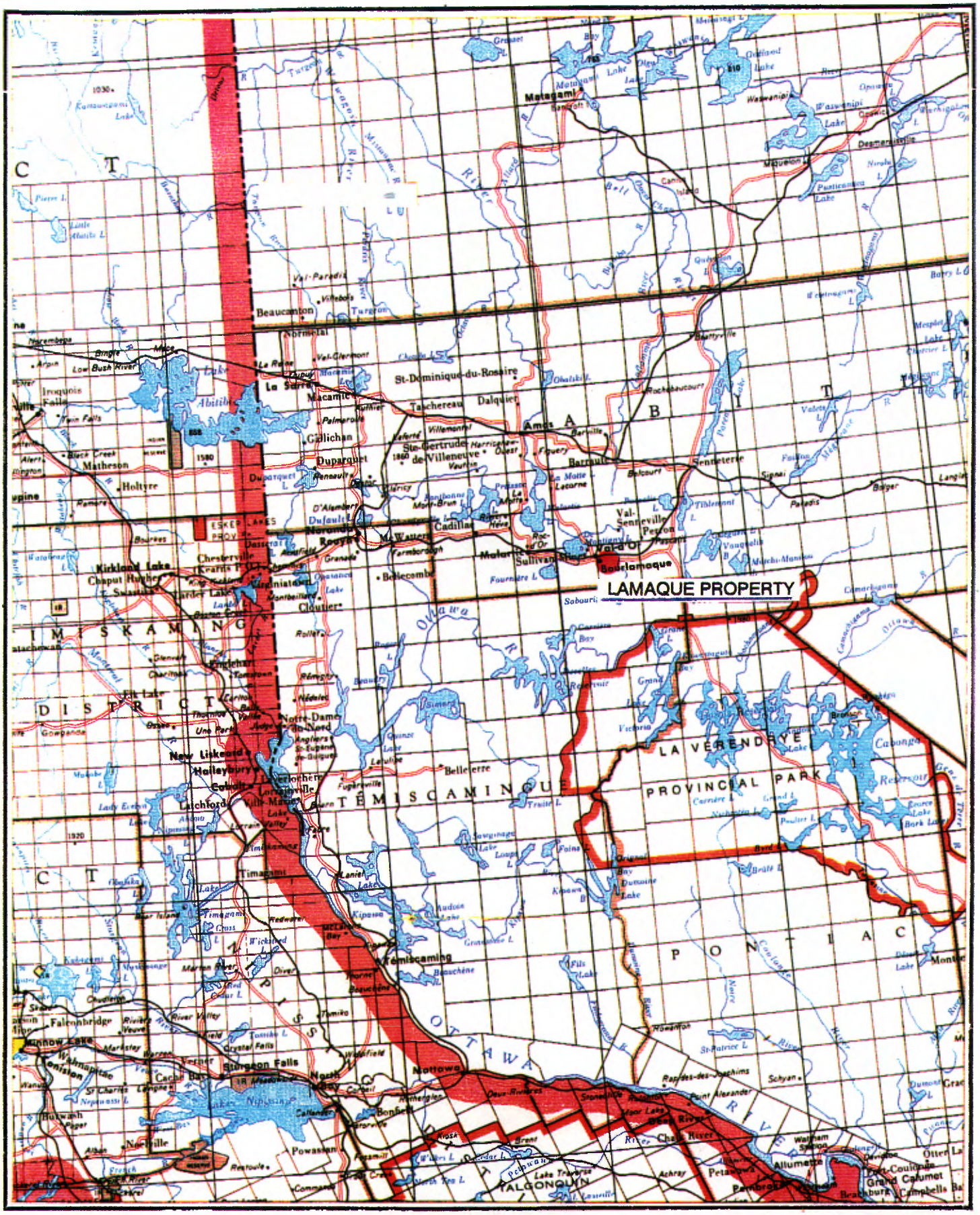
The Lamaque Property is located within the city of Val d'Or in the Abitibi area of northwestern Quebec (Figure 1). Val d'Or is located approximately 520 km north of Toronto and 530 km north-northwest of Montreal. The Val d'Or airport is located on the south edge of the property and has regularly scheduled flights from Montreal. Highway access to the west (Rouyn-Noranda) and south (Montreal) is good.

Highway 117 east of Val d'Or crosses the north part of the property and numerous public and private roads access the property. Part of the city of Val d'Or covers the north-west corner of the claim group.

THE PROPERTY

The Lamaque Property consists of four mining concessions (65 claims) and 17 claims for a total of 1584.89 hectares (Figure 2). The property has grown over the years to it's present size and parts of the property are subject to joint venture agreements.

The three mining concessions 264, 314, 380 (44 claims) constitute the pre 1960, 100% owned Lamaque Property. The Callahan Purchase or Paquette-Callahan Option consists of 5 claims that were optioned in the 1950's? and purchased outright in 1967. The Rocdor East and West (previously Rocdor Centre) Groups (11 claims) have been held since



LOCATION MAP

Figure 1

1 inch equals approximately 32 miles

Miles 20 0 20 40 60 80 100 Miles

before 1960 by Rocdor Mines Limited which is a shell company managed and controlled by Teck. The Villemaque or Mylamaque property (21 claims) was purchased in 1977 by Lamaque Mining (Teck) and Mymar Mining and Reduction Limited (later changed to Dynamar Energy Limited) from Villemaque for indebtedness. In July/August 1991 Dynamar forfeited all rights to the property to Teck as a result of non-payment of their share of costs. The remaining small claim was staked by Teck in 1984 to bring the total to 82.

Figure 3 shows the current status of the property. Presently the Main Mine Area is 100% Teck owned and the Rocdor East property is 100% Rocdor owned. The rest of the property is subject to one of three joint venture agreements.

In 1985 an agreement was signed between Teck and Golden Pond Resources Ltd., whereby Golden Pond could earn 50% of Teck's interest in most of the property. Subsequently Golden Pond spent $2,750,000 on the property and earned their interest. Since 1988 Teck has funded all lease, rent and tax payments and reduced Golden Pond to a 48.8% interest while retaining 51.2%. Expenditures including 1993 rental and tax payments are: Teck $2,887,414 and Golden Pond $2,751,608. If either party dilutes to 15% their interest converts to a 15% NPI.

An agreement between Golden Pond, Rocdor Mines Limited and Teck was signed in 1985 whereby Golden Pond could earn a 50% interest in the Rocdor West Property by spending $250,000 with Teck as operator. This was completed and subsequently Golden Pond has been reduced to a 48.88% interest as a result of non-payment of their share of expenditures. If either party is reduced to 15% their interest will be converted to a 15% NPI.

A 1986 agreement was signed between Teck and Tundra Gold Mines Limited whereby Tundra could earn a 50% interest in the No 4 and No 5 plug areas. Tundra subsequently spent $9,704,570 and earned their interest. Since 1988 Teck has funded all lease, rent and tax payments and reduced Tundra to a 49.81% interest while retaining 50.19%.

1993 COMPILATION PROGRAM

The personnel listed below compiled data, reviewed reports and computer files and drafted results. The costs associated with these endeavours are also presented.

TABLE I

WORK COMPLETED

NAME AND ADDRESS	POSITION AND WORK PERFORMED	NUMBER OF DAYS	COST
A. Christopher RR#5, 19 Legault Street North Bay, Ontario P1B 8Z4	Senior Project Geologist Supervision & Compilation	11.3	2,784.75
R. Stewart 18 Viking Drive Grimsby, Ontario L3M 3V1	Contract Geologist Compilation	17.3	3,669.59
A. Faust 1653A Forest Blvd. Val d'Or, Quebec J9P 5B5	Computer Consultant Computer Reduction of Data	15.0	3,360.00
B. Hopkins RR#5, 19 Legault Street North Bay, Ontario PIB 8Z4	Senior Draftsman Drafting	5.2	1,205.29
	OTHER EXPENDITURES		
Travel and Transport			315.90
Room and Board			1,131.29
Miscellaneous			44.55
		TOTAL	$12,511.37

TABLE II

DIVISION OF CREDITS

CLAIM OR CONCESSION NUMBER	OWNER	AREA	% OF TOTAL AREA	AMOUNT DUE	WORK CREDITED	CASH
Conc 264	Teck Corporation	399.40	25.20	9,490.00	3,152.87	6,337.13
Conc 314	Teck Corporation	396.28	25.00	9,906.75	3,127.84	6,778.91
Conc 375	Teck Corporation	324.14	20.45	8,103.25	2,558.58	5,544.67
Conc 380	Teck Corporation	195.75	12.35	4,893.75	1,545.15	3,348.60
1348121	Teck Corporation	16.00	1.01	Nil	126.37	Nil
1348122	Teck Corporation	16.00	1.01	Nil	126.37	Nil
1348123	Teck Corporation	16.00	1.01	Nil	126.37	Nil
1348124	Teck Corporation	16.00	1.01	Nil	126.37	Nil
1348125	Teck Corporation	16.00	1.01	Nil	126.37	Nil
4228833	Teck Corporation	5.00	0.32	Nil	40.04	Nil
C002081	Rocdor Mines Ltd.	18.18	1.15	Nil	143.88	Nil
C002082	Rocdor Mines Ltd.	18.18	1.15	Nil	143.88	Nil
C008271	Rocdor Mines Ltd.	8.36	0.50	Nil	62.56	Nil
0009731	Rocdor Mines Ltd.	16.00	1.01	Nil	126.36	Nil
0009732	Rocdor Mines Ltd.	16.00	1.01	Nil	126.36	Nil
0009733	Rocdor Mines Ltd.	16.00	1.01	Nil	126.36	Nil
0009734	Rocdor Mines Ltd.	16.00	1.01	Nil	126.36	Nil
0009735	Rocdor Mines Ltd.	16.00	1.01	Nil	126.36	Nil
C002091	Rocdor Mines Ltd.	19.86	1.26	Nil	157.64	Nil
C002092	Rocdor Mines Ltd.	19.87	1.26	Nil	157.64	Nil
C002093	Rocdor Mines Ltd.	19.87	1.26	Nil	157.64	Nil
TOTAL		1,584.89	100.00	32,393.75	12,511.37	22,009.31

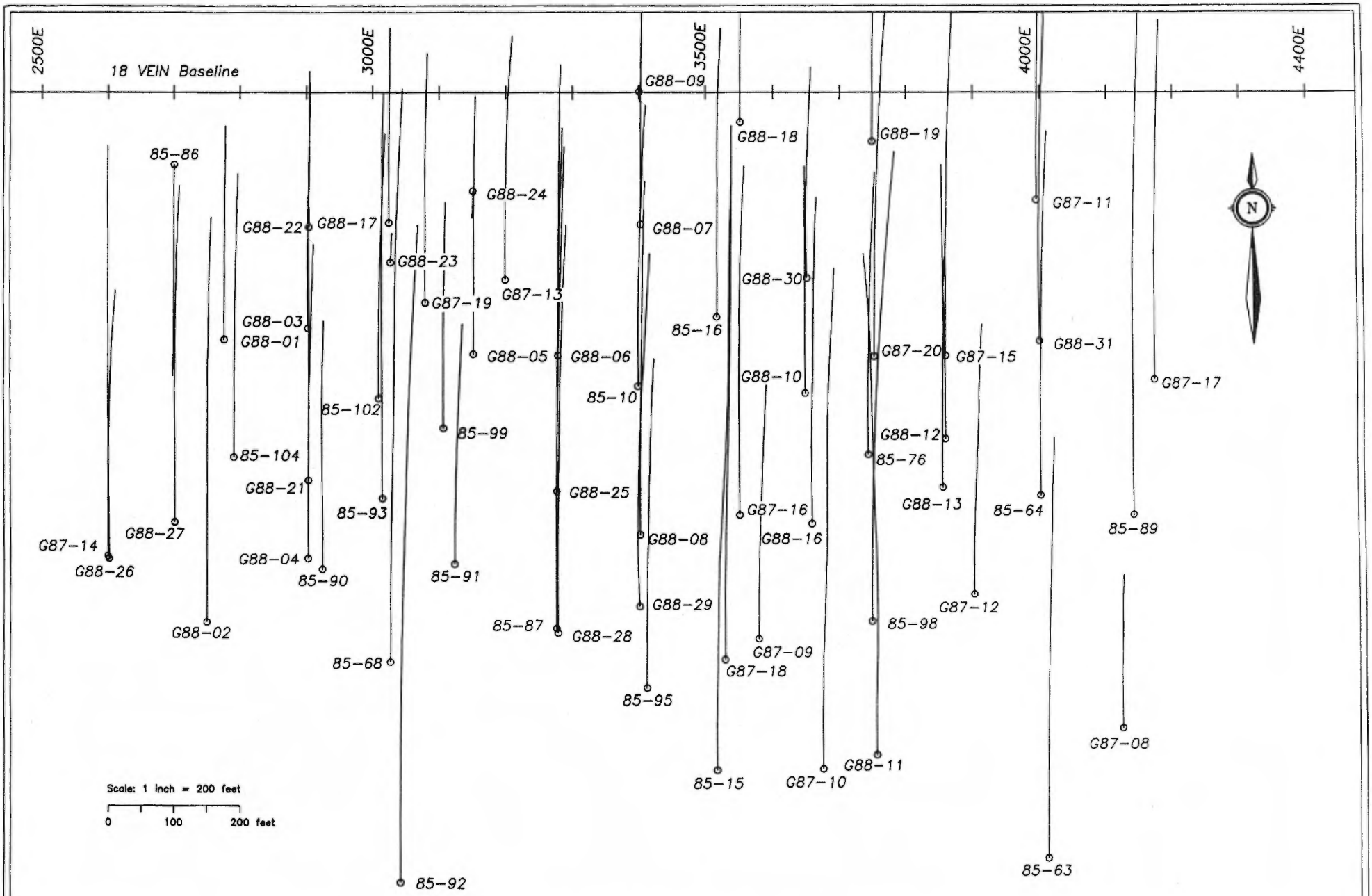


Figure 4. Drill Plan No. 10 Vein Area

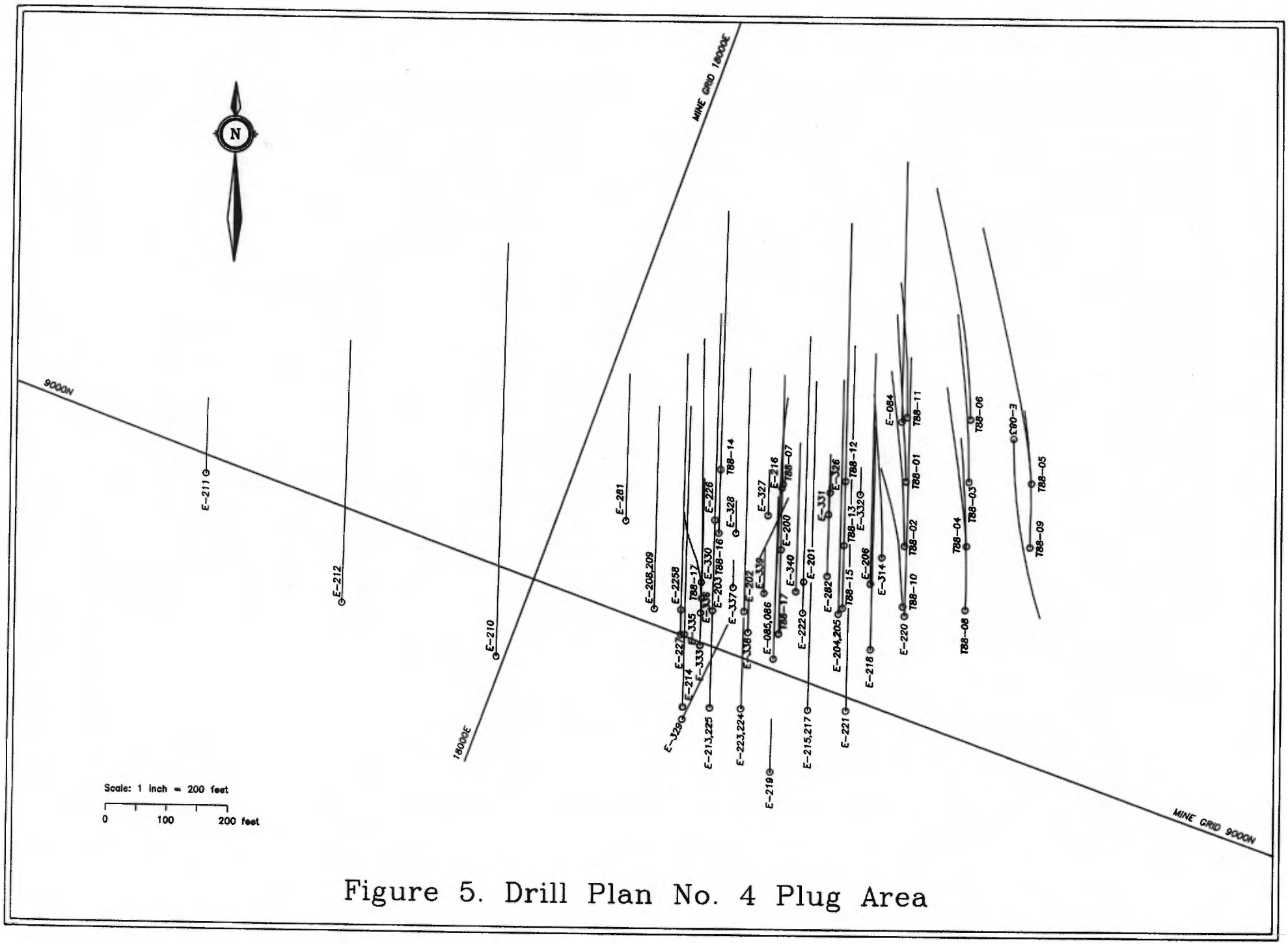


Figure 5. Drill Plan No. 4 Plug Area

HISTORY

Gold was first discovered on the Lamaque property in the fall of 1923 by a prospector named R.C. Clark accompanied by Gabriel Commanda, an Indian guide.

In 1924, William A. Read, an American, took an option on Clark's claims and four years later, in association with Hector Authier, formed Read-Authier Mines Limited.

During the summer of 1932, Teck-Hughes Gold Mines of Kirkland Lake took an option on Read-Authier Mines Limited and in December of the same year formed Lamaque Gold Mines Limited.

The official opening of the mine took place in March 1933, with ore reserves of 74,495 tons grading 0.31 oz/ton. Production began in April 1935 at the rate of 250 tons per day. The capacity of the mill was increased over the years to 2,100 tons per day in 1953, operating seven days per week. In 1973, due to a shortage of zone muck, the mill was reduced to 1,800 tons per day on the basis of a five day week. This rate was maintained until closure in 1985.

During the life of the mine (1935-1985) over 4.5 million ounces of gold and almost 800 thousand ounces of silver were produced from 26.6 million tons of ore (about $1.65 billion US at todays prices).

PREVIOUS WORK

As expected of a property with 50 years of continuous production, the Lamaque Property has produced considerable amounts of data, both surface and underground.

At present there are over 1600 microfiches, 15 computer discs, a full 4 drawer filing cabinet and numerous map tubes containing all the data on the entire Lamaque property. Due to the scope of this report only surface data will be discussed, although pertinent underground data/studies have not been ignored.

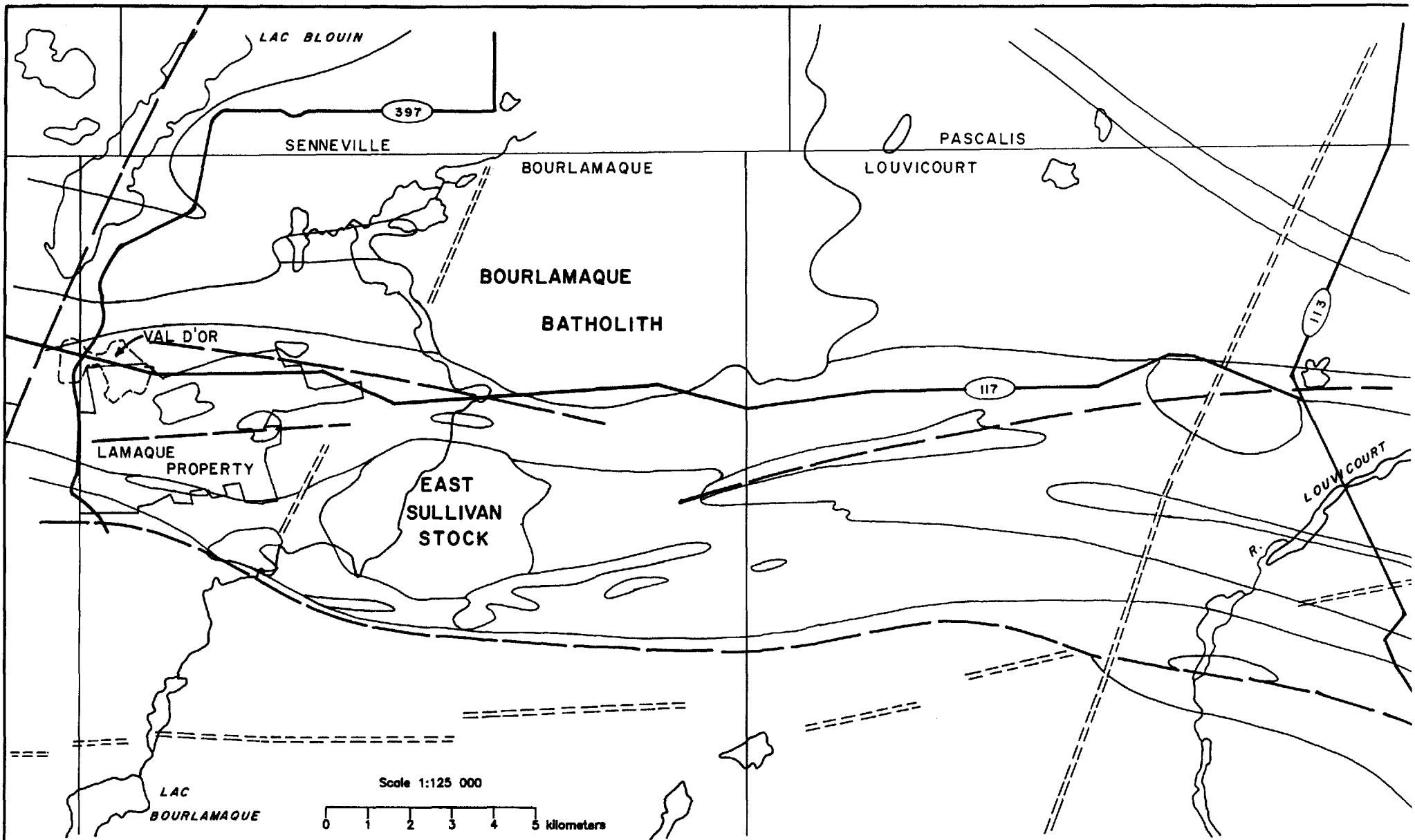


Figure 7. Lamaque Property Regional Geology

The main thrust of the previous exploration programs on the Lamaque property was towards gold mineralization and more specifically to exploring for and to testing additional intrusions similar to the main plug. Other gold bearing vein structures within the volcanics have also seen extensive exploration. These programs (intermittent from the 1950's) generally relied on magnetic surveys and extensive diamond drilling.

Drawing 6954 and Figures 4 and 5 give locations of most of the approximately 1000 surface drill holes and Figure 6 outlines the coverage of past geophysical surveys. Numerous geological maps were produced in the past and the most recent property-wide map was completed by Madon in 1984-85.

Of note is the fact that a surface electromagnetic survey was not completed over the property prior to the 1990 UTEM survey.

REGIONAL GEOLOGY

The Lamaque property is located near the southeastern edge of the Abitibi Greenstone Belt, part of the Superior Structural Province of the Canadian Shield. The Grenville Front is located about 50 km to the southeast and the Cadillac Larder Lake Break is located within 1 km of the south edge of the property.

The property lies on the southern flank of the LaMotte-Vassan anticline, almost entirely within the Upper Malartic Group (Figure 7, Table I). The Val d'Or Formation, consisting primarily of intermediate to felsic pyroclastic rocks, is the dominant geological formation. The extreme southwestern part of the property (airport area) is underlain by mafic volcanics of the Heva Formation flanked to the south by greywackes of the Kewagama Group and the Pontiac Group. Mafic to ultramafic volcanics of the Jacola Formation lie to the north of the Val d'Or Formation in the vicinity of the property.

A variety of intermediate (granodiorite-diorite-gabbro) intrusives similar to the Lamaque main plug intrude the volcanics of the Upper Malartic Group and are small irregular stocks, sills and dykes. A number of larger intrusions are present including the East Sullivan

Stock located to the east-southeast and the large Bourlamaque Batholith located to the north of the property. Later diabase dykes cut all lithologies.

PROPERTY GEOLOGY

The true nature of the stratigraphy present on the Lamaque property is sketchy as previous work, directed towards gold exploration, has relied heavily on mine terminology and has mis-classified many of the volcanics.

Karvinen (1985) noted that:

> "Most geologic descriptions of Lamaque (eg. Dresser and Denis, 1949; Bedard and Imbeau, 1980) borrow heavily from the early works published by Wilson first in 1936 and repeated with some modifications in 1948 and partly from an unpublished geologic synthesis of Lamaque by Bridger in 1949. Over the years, a complex and cumbersome nomenclature of rock types has been developed at the mine, parts of which have crept into the recent literature."

Imreh (1987) also noted the strong emphasis put on intrusions and the failure of past work to emphasise the extent and importance of the volcanics. He states that:

> "La seule carte à grande échelle (1/2400) est celle de Madon réalisée en 1985. Elle est, toutefois, la projection à la surface de la vision et de la nomenclature souterraines de H.S. Wilson (1936) où les intrusions prenaient une place exagérée. Les rares publications produites entre 1936 et 1985 reflètent, elles aussi, à quelques modifications près, fidèlement le patron et la nomenclature de Wilson (1936). Citons à titre d'exemple les travaux de Dresser et Denis (1949), Bédard et Imbeau (1980) et Daigneault (1983).
>
> Poutant, l'importance de la phase volcanique a été déjà mise en évidence sur la carte de Norman (1947) où le secteur de la mine Lamaque est défini comme ≪Diorite porphyry (...) includes andesite porphyry and/or

TABLE III

TABLE OF GEOLOGICAL FORMATIONS

PROTEROZOIC
DIABASE DYKES

ARCHEAN
GRANITIC INTRUSIONS
- ie. BOURLAMAQUE BATHOLITH

MAFIC INTRUSIONS
- ie. EAST SULLIVAN STOCK

MAFIC INTRUSIONS
- ie. LAMAQUE PLUGS

PONTIAC GROUP
- greywacke

KEWAGAMA GROUP
- greywacke

UPPER MALARTIC GROUP
HEVA FORMATION
- mafic volcanics

VAL D'OR FORMATION
- intermediate to felsic volcanics

JACOLA FORMATION
- mafic and ultramafic volcanics

LOWER MALARTIC GROUP
UPPER DUBUISSON FORMATION
- mafic volcanics

LAC CASTE FORMATION
- sediments

LOWER DUBUISSON FORMATION
- mafic volcanics

volcanic rocks≫. Karvinen (1985), reconnaissant cette réalité, a mentionné que plusieurs intrusions felsiques doivent être, en réalité, des volcanites."

The job of unravelling the property geology is made even more difficult by combining this past emphasis on mine terminology and intrusives with the fact that "the volcanic rocks on the property, as with the majority in the Val d'Or area, are difficult to distinguish in outcrop or hand specimen. For example, at the Louvem Mine, a green chloritized agglomerate classified as an andesite assayed 68% SiO_2 and therefore was reassigned the name 'rhyo-dacite'. In another specimen a dacitic tuff had sufficiently high silica content (72% SiO_2) to be classified as a 'rhyolite'" (Scammell, 1989i).

Figure 8 gives a 1988 interpretation of the General Geology of the Lamaque Property, however the surface extent of the intrusions in the mine area are likely exaggerated. The following section contains portions of geological descriptions by Madon which are contained in Report 959T by Blecha (1986d).

> "..... A recent lithostratigraphic classification (Imreh, 1984) places the Lamaque property within the Val d'Or Formation - a vent-proximal sequence of andesitic flow breccias and pyroclastics with minor pillowed to massive flows.
>
> Structurally, the volcanics comprise a general east-west to east-northeast trending and vertical to south-dipping homoclinal sequence. .....
>
> The mafic-intermediate pyroclastics are, by far, the most prevalent rock type, covering roughly 60-65% of the property. The unit consists of crudely stratified fine-grained ash tuffs to coarse block tuffs with angular fragments up to 80 cm long. Subdividing this unit at surface is difficult because of the generally crude stratification and poor outcrop exposure. .....
>
> The mafic pillow flow breccias and isolated mafic pillow flows are also relatively abundant, outcropping primarily along the northern, northwestern

and southern margins of the property. This unit thickens considerably in the NW corner of the property, forming the dominant rock type in the Bourlamaque village area. Narrow discontinuous flow and flow breccias outcrop within the east-central portion of the property as well, ...

The dioritic feldspar porphyries ..... previously designated as the "DPC" ..... are most prevalent around the main mine, the No. 5 plug, the No. 2 mine, and No. 3 mine and the 'West Plug'. .....

The granodiorite feldspar porphyries are texturally similar to the diorite feldspar porphyries, with the major difference being a more siliceous light grey matrix. This rock type occurs in the form of irregular, occasionally discontinuous intrusive dykes ..... and as roughly circular plugs .....

The felsic to intermediate volcanic tuffs occur primarily within a 600' wide band running through the east central part of the property. This unit, composed mainly of weakly to moderately sericitic tuffs with minor quartz-tourmaline-carbonate-pyrite exhalative horizons appears to be a distal facies equivalent to the vent proximal volcanic package ..... A narrower (400') felsic volcanic interval outcrops in the SE corner of the property (Roc d'Or Est) and is likely the stratigraphic equivalent of the felsic volcanics hosting the massive sulphide mineralization at the old East Sullivan mine. A sulphide-rich gossan was noted on one particular outcrop although grab samples did not return any gold values.

The usually magnetic diorite occurs both as relatively small (300' to 700') roughly circular plugs (portions of the Main Plug and the West Plug as well as most of the No. 5 plug and the No. 4 plug), and as a 300'-500' wide dyke (sill?) trending in an east-southeast direction across the southern limit of the property. A pyroxene-bearing diorite porphyry, probably related to the more massive variety, was outlined west of the Main Plug, ...

The granodiorite occurs exclusively as roughly circular intrusive plugs- the central core of the Main Plug, all of the East Plug and a small portion of the No. 5 plug. ....."

DISCUSSIONS & RECOMMENDATIONS

The extensive package of stratigraphy favourable for hosting a VMS deposit on the Lamaque Property has received little or no previous comprehensive systematic exploration for base metals. The sole previous stab at a quick base metal discovery was the 1990 UTEM survey which failed to outline a geophysical anomaly significant enough to warrant drill testing. Fortunately Aur Resources did not use a similar approach when exploring the Louvicourt Property as the Aur UTEM survey did not originally detect the Louvicourt ore zone. Bubar (1990) describes "Louvicourt as a geological discovery, as it was found by doing systematic deep diamond drilling based on a geological concept. The deposit is essentially blind from surface ....."

The stratigraphy of the Val d'Or Formation, present on both the Lamaque (Teck) and Louvicourt (Aur) properties, represents vent proximal facies volcanics formed in an island arc environment (Imreh, 1982). These rocks "evolved at a time when there was a considerable amount of explosive volcanic activity. There were periods of quiescence when the volcanos were relatively inactive and it was during these times that the base metal deposits formed. Vallee (1972) stated that there were possibly between 6 and 10 such periods or stratigraphic horizons in which Zn-Cu mineralization was deposited" (Scammell, 1989i) within the Val d'Or Formation.

Detailed geological mapping with an emphasis on physical volcanology combined with thin section work and whole rock analysis is required to:

(1) understand the property stratigraphy.
(2) identify possible syn-volcanic structures.
(3) outline "prospective" horizons for detailed exploration and drilling.

The fact that alteration zones associated with VMS deposits form a significantly larger target than the actual mineralization makes a lithogeochemical study on the Lamaque Property an ongoing requirement of any comprehensive base metal exploration effort. As many of the concepts used in exploration of the Lamaque Property will be based on the Louvicourt deposit it will be important to study the geology, alteration and mineralization associated with it. The following excerpt from Bubar (1990) lists some of the characteristics of the mineralization and alteration at the Louvicourt deposit.

> "Metal zoning patterns observed to date show a classical vertical zonation from a copper-rich base to a zinc-rich top. However, a classical Noranda type cross-cutting stringer copper zone below the massive sulphides has not been identified beneath the Louvicourt deposit. Instead, the stringer copper mineralization at Louvicourt appears to be conformable with the stratigraphy extending away from and/or enveloping individual sulphide lenses.
>
> Likewise, the associated hydrothermal alteration of the wallrocks of the Louvicourt deposit also seems to form a broadly conformable envelope around the massive sulphide lenses. Close to the massive sulphides intense black chlorite/iron carbonate alteration is developed which grades outwardly into a halo of dominantly sericitic alteration that may locally contain chloritoid porphyroblasts. Stratigraphically above the massive sulphides a distinctive iron-rich alteration assemblage is developed consisting of green chlorite with magnetite and garnet.
>
> Chemically, the alteration zone is characterized by typical volcanogenic massive sulphide alteration patterns: that is, intense Na_2O, CaO depletion coupled with MgO, K_2O enrichment. Na_2O depletion is especially characteristic and we have found that the "Spitz Ratio" (Al_2O_3/Na_2O) to be the most useful ratio here for mapping alteration patterns."

PROPOSED PROGRAM

A program is proposed for 1994 to begin systematic exploration of the Lamaque Property for VMS deposits. As this property has significant potential, a minimum of 3 years will be required to adequately evaluate the project.

The 1994 program should include:

(1) re-establishing 18 vein baseline grid at 400' spacing (areas of higher outcrop density may require a 200' spacing)
(2) detailed geological mapping and prospecting
(3) detailed lithogeochemistry for both rock identification and alteration studies.
(4) thin section work
(5) review of 1990 UTEM survey
(6) study of Louvicourt deposit

Respectfully Submitted



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Teck Exploration Ltd

Rep-0175/eg

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